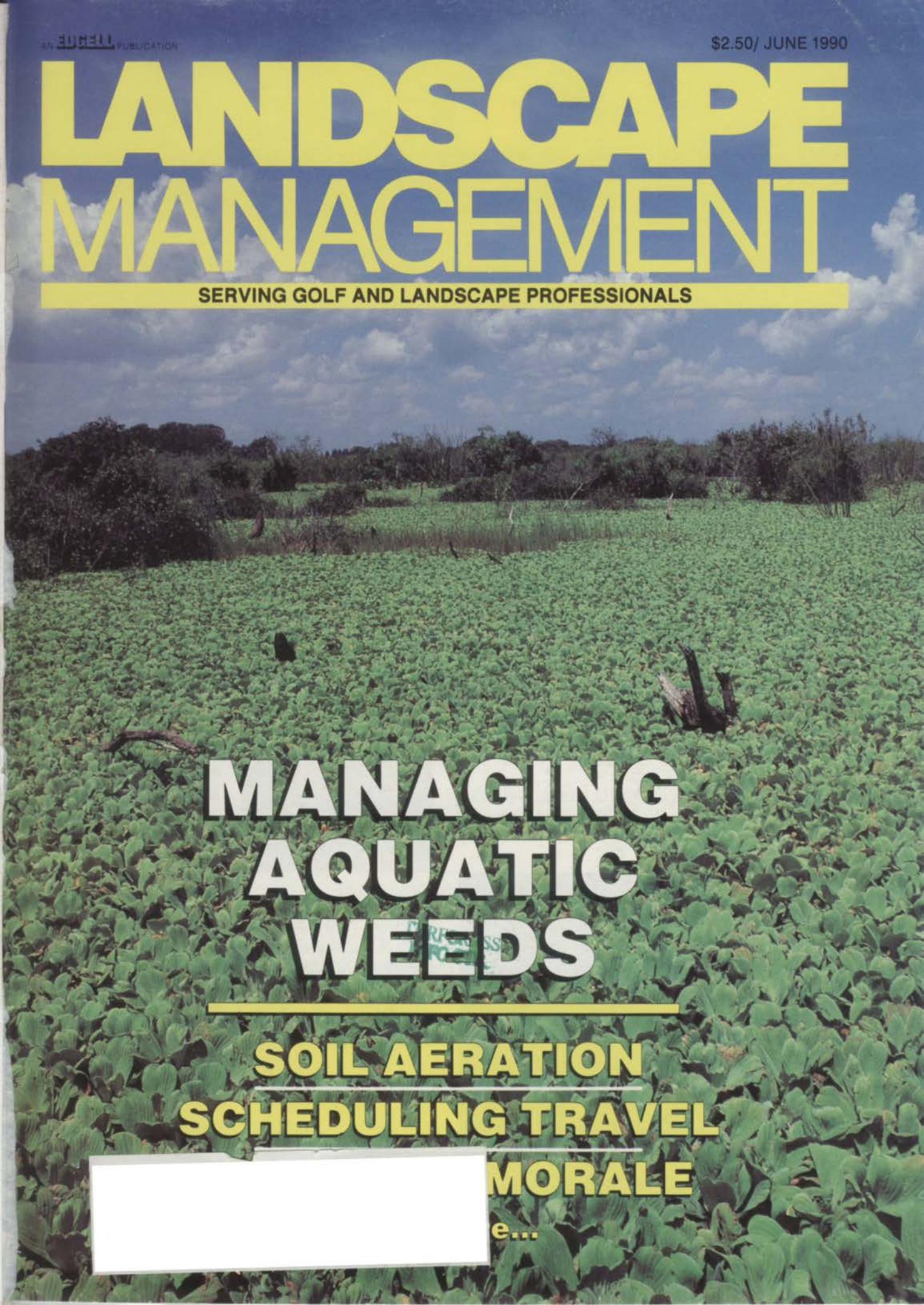
AN EDITED PUBLICATION

$2.50/ JUNE 1990

LANDSCAPE MANAGEMENT

SERVING GOLF AND LANDSCAPE PROFESSIONALS



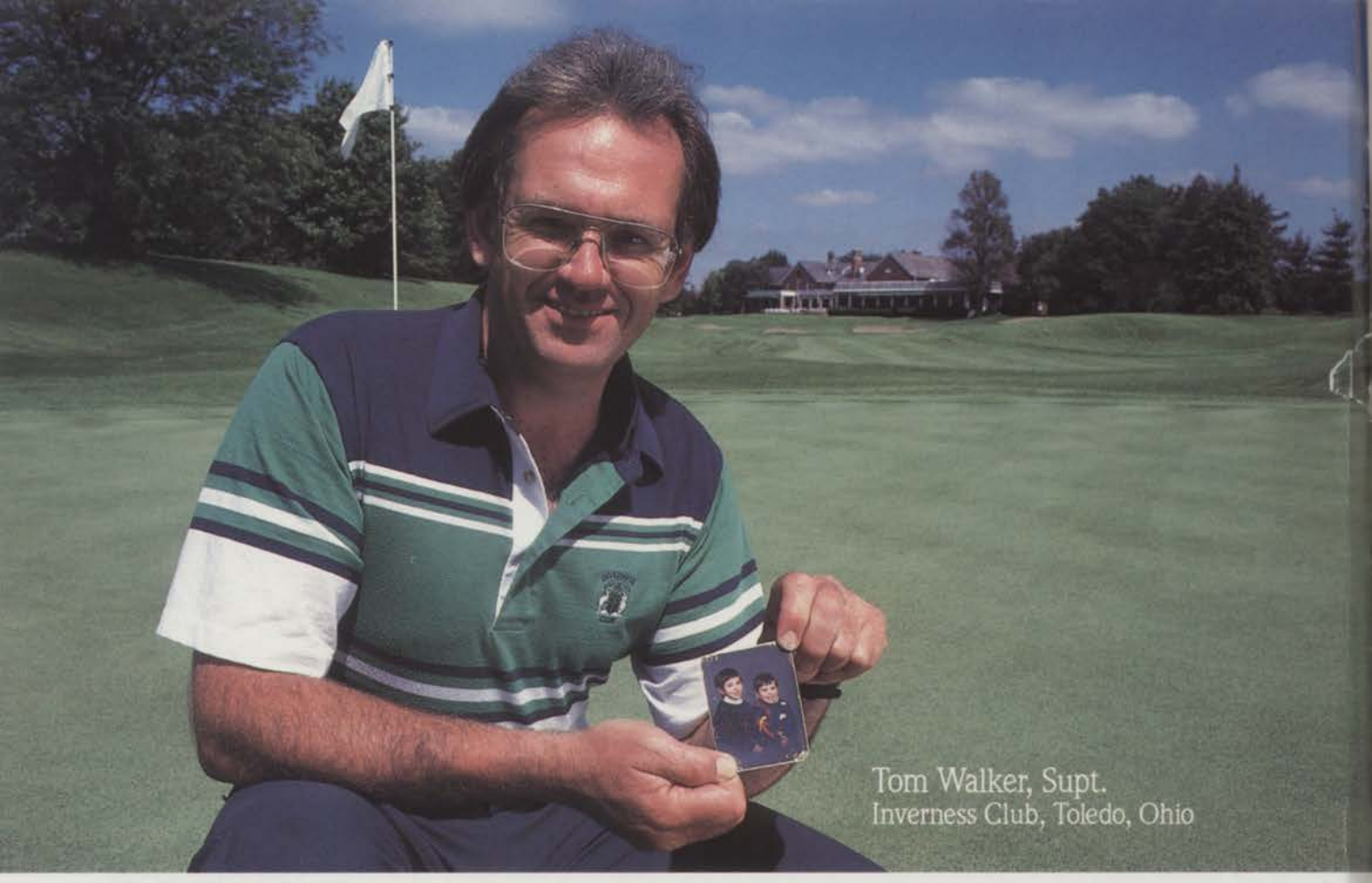
MANAGING AQUATIC WEEDS

SOIL AERATION

SCHEDULING TRAVEL

MORALE

e...



"Talking about PennLinks is like talking about my kids…I could go on forever."

A few of Tom Walker's words on PennLinks:

"The first thing that impressed me about PennLinks was its pleasant color. And our longer 5/32" cut promotes good root growth and reduces chance of scalping."

"In less than a year, PennLinks' roots reached a depth of 14 inches in our compacted soil. This increased carbohydrate reserve helps carry PennLinks through stressful times."

"PennLinks' fine texture and upright growth allows a longer cut with less grain and a respectable speed. You just can't ask for a better putting green grass."

One of the 'Penn Pals'

PennLinks®
CREEPING BENTGRASS

And about his boys:
"I couldn't have done any better there, either."

Tee-2-Green Corp. • PO Box 250, Hubbard, OR 97032 • 503-981-9574 • FAX 510-981-5626 • **1-800-547-0255**

Circle No. 132 on Reader Inquiry Card

JUNE 1990, VOLUME 29, NUMBER 6

LANDSCAPE MANAGEMENT

On the cover: Unmanaged water lettuce growth chokes a Florida stream.

22 COVER STORY: MANAGING AQUATIC WEEDS
by Joe Hinkle. A challenge of the '90s will be to achieve a realistic balance between habitat requirements and the public's concern for recreational access and lake aesthetics.

30 REVIVE YOUR POND WITH AERATION
Summer's heat can turn a pond into a smelly, slimy well. Aeration equipment can revive it and provide an interesting landscape element in the process.

36 WHEN THE RUBBER MEETS THE ROAD
by Phil Christian III. Managing travel time is a never-ending problem for landscape managers. When does the clock start? How does travel time affect the total costs of the activity, the production, and people who are traveling?

40 AERATION WORKS!
by Terry McIver. If turf could talk, you'd hear all about the benefits of soil aeration. It's a service worth selling.

46 THE BAYOU: CLEARING ITS WATER
With more than 6.4 million acres of freshwater habitat and a sub-tropical environment that favors rapid aquatic weed growth, Louisiana is hard-pressed to keep water hyacinth from completely choking many waterways.

50 FUTUREVISION
by Jerry Roche. The 1990s will bring more judicious use of chemicals, a more aesthetic landscape and closer involvement between management and labor, according to a respected panel of green industry executives.

52 WORKING OVERTIME ON MORALE
by Ed Wandtke. By eliminating 'de-motivators,' you can improve employee morale and production during the long weeks of spring and summer.

DEPARTMENTS

4 As I See It . . .

8 Green Industry News

18 Short Cuts

19 Events

19 Letters

54 Jobtalk

56 Products

64 Classified

67 Ad Index

68 Problem Management

LM Editorial Staff

Jerry Roche
Exec. Editor

Will Perry
Mg. Editor

Terry McIver
Assoc. Editor

LM Editorial Advisory Board

Doug Chapman
Horticulturist
Dow Gardens
Midland, MI

J.R. Hall
Extension Agronomist
VPI & SU
Blacksburg, VA

Kent Kurtz
Professor
Horticulture
Cal Poly-Pomona

Harry Niemczyk
Professor
Ohio State University
Wooster, OH

A. Marty Petrovic
Assoc. Professor
Cornell University
Ithaca, NY

LANDSCAPE MANAGEMENT (ISSN 0894-1254) is published monthly by Edgell Communications, Inc. Corporate and Editorial offices: 7500 Old Oak Boulevard, Cleveland, Ohio 44130. Advertising Offices: 7500 Old Oak Boulevard, Cleveland, Ohio 44130, 233 North Michigan Avenue, 24th Floor, Chicago, Illinois 60601 and 3475 Lenox Road, N.E., Suite 665, Atlanta, Georgia 30326. Accounting, Advertising Production and Circulation offices: 1 East First Street, Duluth, Minnesota 55802. Subscription rates: $25 per year in the United States: $50 per year in Canada. All other countries: $100 per year. Current issue single copies (pre-paid only): $2.50 in the U.S.; $5.00 in Canada; elsewhere $10.00; add $3.50 per order for shipping and handling. Back issues, if available, $10; add $3.50 per order for shipping and handling (pre-paid orders only). Office of publication: Edgell Communications, Inc., 1 East First Street, Duluth, Minnesota 55802. Second class postage paid at Duluth, Minnesota 55806 and additional mailing offices. Copyright© 1990 by Edgell Communications, Inc. All rights reserved. No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical including photocopy, recording, or any information storage and retrieval system, without permission in writing from the publisher.

POSTMASTER: Send address changes to LANDSCAPE MANAGEMENT, P.O. Box 6198, Duluth, Minnesota 55806.

ABP BPA EDGELL COMMUNICATIONS

How to keep your acres and acres of earth looking like a little slice of heaven.

Adopt a Mobay fungicide program, and start producing turf that's a cut above.

Start with BAYLETON® Turf and Ornamental Fungicide. It has an unequaled reputation for stopping *dollar spot* while giving you broad spectrum disease control.

In addition, BAYLETON eliminates costly multiple applications. You see, it works systemically, entering the plant and working from the inside. Since BAYLETON won't wash off, it lasts longer.

For *leaf spot,* treat with DYRENE® Turf Fungicide. Quite simply, nothing works better. Plus, the flowable formulation of DYRENE gives you longer residual control than regular contact fungicides. And that adds up to a lower cost per day of control.

Best of all, both BAYLETON and DYRENE have a long history of unmatched performance.

For more information, contact your Mobay distributor or Mobay sales representative. They can set you up with a fungicide program that'll help you keep your acres looking like a little heaven on earth.

Bayleton
Dyrene

Treat your fairways with BAYLETON and DYRENE. It keeps your customers from tracking disease up onto your tees and greens, and raises the overall quality of your course.

Apply BAYLETON for broad spectrum control on a wide variety of ornamental plants.

Plant turf varieties that resist diseases in your area. Apply a balanced fertilizer. Aerate, irrigate, and dethatch periodically.

BAYLETON and DYRENE are Reg TMs of Bayer AG, Germany ©1989 Mobay Corporation

In addition to dollar spot, BAYLETON prevents summer patch, anthracnose, and other major turf diseases.

DYRENE prevents brown patch and leaf spot with excellent residual control.

Mobay Corporation
A Bayer USA Inc. Company

Bayer MOBAY

Specialty Products Group
Box 4913, Kansas City, MO 64120
816-242-2333

Circle No. 120 on Reader Inquiry Card

AS I SEE IT...

Earth Day at the 'zoo'

I felt safe. The only leather I wore was my belt and watchband. I was sure to melt into the crowd gathered to celebrate Earth Day—that nationwide science project—at the Cleveland Zoo.

My car belched carbon monoxide, but so did other cars. Besides, this was a celebration of our collective guilt.

Cars were illegally parked on what the day before was healthy turf. Wasn't that compacted grass now crying out in pain?

The zoo skyline was dotted with helium-filled balloons, despite literature which told of the danger the tiny blimps pose to aquatic life.

A seven-foot-tall petition was riddled with signatures. The theme of the petition was "Rescue the Future." A woman borrowed my pen to sign her name. I asked her why she signed. "To rescue the future," she said. I was hoping for something a little deeper, but...

A man in black robe and death mask held a sign: "I represent failure to address population control, topsoil erosion, irresponsible consumption." ...And someone with lots of free time.

In the amphitheatre, a speaker mused plaintively: "I wonder why the squirrels in my neighborhood have bare patches of skin from lawn chemicals. Didn't they see the warning signs on the lawn?...How did a lawn come to be more valuable than a prairie?"

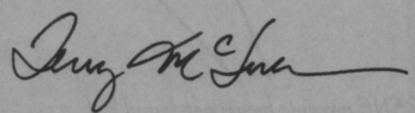
A woman from the Northeast Ohio Greens handed me a list of the "Ten Key Values of the Great Committees of Correspondence." Sort of like a Soviet five-year plan for agriculture. Their goals include "grassroots democracy," "decentralization," and "post-patriarchal values."

She wore a beret and sunglasses. We were indoors.

I got her started on lawn care products. "A single pellet will kill a worm in a minute-and-a-half," she rasped, insisting that worms should be left to aerate the soil. She soon became miffed enough to reveal a hidden agenda. The gloves (and glasses) were off as she intoned about companies that kill worms "and make a fat, $fi&!-ing profit!" Nice talk, lady!

The *true* green industry has the information to refute this silliness. Turfgrass helps prevent soil erosion and controls dust and noise. Aerators help worms aerate the turf. Prairies are fine examples of the beauty of the American landscape, but they don't work so well in the neighborhoods. Much of the rhetoric I encountered was tinged with rancor toward corporate America. The real demon, for many Earth Day disciples, is profit.

A co-director of the event told me organic control companies were welcome. Any companies that use chemicals would most likely have been denied, but apparently, none applied! That's our fault. We're obviously on our own. Let's continue to tell our side of the story, whenever and wherever we can...or are allowed.



Terry McIver, associate editor

LM

EDITORIAL STAFF

Jerry Roche, Executive Editor
Will Perry, Managing Editor
Terry McIver, Associate Editor
Office: 7500 Old Oak Blvd.
Cleveland, OH 44130
(216) 243-8100
FAX (216) 826-2832

MARKETING STAFF

Dick Gore, Publisher
Office: 3475 Lenox Rd. N.E.
Suite 665
Atlanta, GA 30326
(404) 233-1817
FAX (404) 261-7022

Jon Miducki, National Sales Manager
Marsha Dover, Midwest Sales Manager
Bob Earley, Group Vice President
Office: 7500 Old Oak Blvd.
Cleveland, OH 44130
(216) 243-8100
FAX (216) 826-2832

Robert Mierow, W. Coast Representative
Office: 1515 NW 51st Street
Seattle, WA 98107
(206) 783-0549
FAX (206) 784-5545

Tom Greney, Senior Vice-President
Office: 111 East Wacker Drive
Chicago, IL 60601
(312) 938-2317
FAX (312) 938-4850

SUPPORT STAFF

Carol Peterson, Production Mgr.
Connie Freeland, Prod. Supervisor
Lynn Williams, Graphic Design
Jackie Eisenmann, Circulation Super.
Bonnie DeFoe, Directory Coordinator
Gail Parenteau, Reader Service Mgr.
Office: 120 West Second St.
Duluth, MN 55802
(218) 723-9200
FAX (218) 723-9223

David Komitau, Graphics Coordinator
Ted Matthews, Promotion Director
Office: 7500 Old Oak Blvd.
Cleveland, OH 44130
(216) 243-8100

EDWELL COMMUNICATIONS

Richard Swank, Chairman; Robert L. Edgell, Vice Chairman; Richard Moeller, President; Lars Fladmark, Executive Vice President; Arland Hirman, Vice President/Treasurer; Thomas Greney, Senior Vice President; Ezra Pincus, Senior Vice President; Joe Bilderbach, Vice President; James Gherna, Vice President; George Glenn, Vice President; Harry Ramaley, Vice President.

Turf-Seed's CITATION II

contains naturally pest resistant endophyte

. . . a fungus that occurs within plant tissue between the cells.

New turf breeding discovery proves resistance to bill bugs, sod webworm, and other pests without harmful chemicals!

Left, insect damage in perennial ryegrass. Right, endophytic ryegrass resists insect pests.

CITATION II Turf-Type Perennial Ryegrass

is well known for its rapid establishment, fine texture, dark green color, improved mowability and drought tolerance, both in a monostand or as part of CBS II blend. But, the REAL plus is Citation II's high endophyte level (over 80%) that make it naturally resistant to leaf eating insects.

This plus results in savings . . . in chemical costs to maintenance people and less exposure to insecticides for applicators, homeowners, golfers and picnickers.

Citation II is not only an investment in finer turf, but it's a savings account for turf managers . . . and our delicate planet.

PVP 8400142. Unauthorized propagation prohibited.

Black lines are endophyte mycelium in leaf tissue.

Magnified endophyte in seed.

Qualified turf grass associations can earn cash for turf research by saving Citation II Oregon certified blue tags. Call us or write for details.

Produced and marketed by:

TURF-SEED
Turf-Seed, Inc.
®

PO Box 250, Hubbard, OR 97032
Outside Oregon 1-800-247-6910
503-981-9571 TWX 510-590-0957
FAX 503-981-5626

LANDSCAPE MANAGER OF THE YEAR

co-sponsored by

PROFESSIONAL GROUNDS MANAGEMENT SOCIETY • 1911 • PGMS

LANDSCAPE MANAGEMENT
Formerly WEEDS TREES & TURF

1989 Landscape Manager of the year **Morris Lee Martin**

Entry forms are now being accepted by the Professional Grounds Management Society and LANDSCAPE MANAGEMENT magazine for their fourth annual "Landscape Manager of the Year" award.

The purpose of the award is to recognize superior job performance among landscape managers, to challenge those involved in the industry, to achieve higher standards of excellence, and to bring national recognition to deserving managers.

Any person directly responsible for the professional maintenance of one or more landscapes is eligible to enter. Applicants will be judged according to job performance, honors and awards, procedures and philosophies, and contributions to the green industry. Applicants will be asked, at the time of entry, to submit four 5 x 7 black-and-white glossy photos and 10 color 35mm slides of current work areas with a short narrative on each.

First prize is round-trip airline fare to the Green Industry Expo, Nov. 11-14 in Nashville, Tenn., where the award will be presented.

(clip and mail)

Applicant's name **Title**

Applicant's company

Official entry form should be sent to:

Name **Title**

Company

Address **City/State** **Zip Code**

Mail to: PGMS, Landscape Manager of the Year, 1201 Galloway Ave., Suite 1E, Cockeysville, MD 21030, 301-667-1833

For The Golf Course Superintendent Who Has Everything.

RED THREAD:
2 oz./1,000 sq.ft. every 14-21 days.

POWDERY MILDEW:
1-2 oz./1,000 sq.ft. every 14-28 days.

SNOW MOLD:
4 oz./1,000 sq.ft. applied late fall.

RUST:
1-2 oz./1,000 sq.ft. every 14-28 days.

ANTHRACNOSE:
1-2 oz./1,000 sq.ft. every 14-28 days.

BROWN PATCH:
2-4 oz./1,000 sq.ft. every 10-21 days.

STRIPE SMUT:
1-2 oz./1,000 sq.ft. applied late fall or early spring.

SUMMER PATCH:
4 oz./1,000 sq.ft. applied April-June, or according to local recommendations.

DOLLAR SPOT:
1 oz./1,000 sq.ft. every 28 days.

Only Banner® lets you prescribe just the right preventive treatment for so broad a spectrum of turfgrass diseases. For even more helpful information, contact your turf products distributor.

Circle No. 104 on Reader Inquiry Card

©1990 CIBA-GEIGY Corporation, Turf and Ornamental Products, Box 18300, Greensboro, NC 27419. Always read and follow label directions.

GREEN INDUSTRY NEWS

LANDSCAPE MANAGEMENT

JUNE 1990, VOLUME 29, NUMBER 6

RESEARCH

New paths being explored by USGA's Green Section

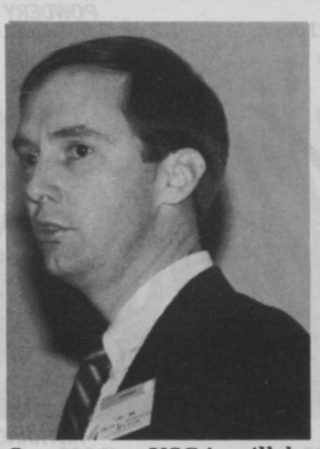
PEBBLE BEACH, Calif. — Coordinating scientific literature relating to golf course management and educating the public about the benefits of golf are two primary research programs to be undertaken by the United States Golf Association (USGA) Green Section.

A research firm working with USGA to determine what issues the organization ought to be addressing recently released its findings. It called for heightened awareness in five environmental areas:

- water management issues;
- the impact of soil, nutrient, and pest management measures on golf courses that are already established;
- the impact of construction and erosion control;
- alternate methods of pest and disease control; and
- developing pro-active approaches to the benefits of golf.

Speaking at the 44th annual meeting of the American Society of Golf Course Architects, USGA northeast region director James T. Snow said, "We decided that the most important thing to do was to put out a manual that describes things already known about the best practices for minimizing the effect of golf course management on the environment."

Snow, who will take over for retiring USGA National Director William H. Bengeyfield, said the organization will generate a 150-page technical manual that is to include all peer-reviewed scientific literature on the effects of pesticides, fertilizers, turfgrass and golf courses on the environment. A smaller manual for the media will be coordinated as well.



Snow: says USGA will be looking into alternative methods of pest control for golf course membership

The second phase of the research program will examine the fate of pesticides in the turfgrass environment. The research report showed that there's much less information available about this subject than other areas, said Snow. "Our research is to be done in three or four areas of the country. Based on that, maybe we can develop a good modeling system to tell us how certain groups of pesticides move within a certain soil profile."

Also, USGA will develop a manual for alternative pest control. "Biologicals are one area, but we're also talking about mechanical and cultural, maintenance, pest-resistant grasses and investigate newer methods of pest control on golf courses," said Snow.

He added that the USGA, like the GCSAA, wants to look at the benefits of golf courses on our lives and our environment, based on scientific data.

Snow added the USGA Green Section is committed to continuing its relationship with the GCSAA, including work on pest-tolerant and salt-tolerant grasses, water use and funding for environmental issues. □

RESEARCH

New uses for triazole fungicides found

BLACKSBURG, Va. — Triazole fungicides and other bio-stimulants containing cytokinins have demonstrated an ability to "keep grass plants younger," says Dr. R.E. Schmidt of Virginia Polytechnic Institute and State University.

Schmidt initiated the new research work using Banner fungicide and a seaweed extract that enhance or stimulate root growth and overall strength of sod. He also observes that turf treated with bio-stimulants showed increased drought resistance and better growth at low soil moistures, along with a reduction in *Poa annua* seedhead development in bentgrass putting turf.

"Bio-stimulants" are materials—other than essential plant nutrients—that promote plant growth when used in small quantities. Triazole fungicides are classified as synthetic bio-stimulants, and seaweed extracts are natural bio-stimulants. Both have shown to have a positive influence on turfgrass.

"We have also shown more tolerance to low temperatures by bermudagrass and better uptake of nutrients—which means less fertilizer use—by using bio-stimulants," Schmidt notes. "We're stimulating a lot of enzymes within the plant."

He says that warm-season grasses seem to show better results using the seaweed extracts while cool-season grasses show better results with the triazole fungicides. He adds that results seem to be better when the grass is under stress. □

LANDSCAPE

Boom slows in most areas as '90s begin

WASHINGTON, D.C. — The boom in landscaping in the 1980s is slowing slightly as the new decade begins, according to statistics from the National Landscape Association (NLA).

The NLA sees continued growth in the Great Lakes region and Florida, but is not as optimistic elsewhere in its 14th annual economic survey of member firms.

The NLA also notes that the National Association of Home Builders reports stagnant or falling prices in some former real estate hot spots on the East and West coasts. The builder's group was somewhat pessimistic about future homes sales, but this didn't totally dampen the NLA's outlook. It reasoned that if people stay in the same house longer, they'll be more apt to upgrade their landscaping.

The NLA survey according to region:

Northeast. An economic slowdown. Total landscape sales for 1989, "by far" the worst reported with an average 6 percent growth. Overall, sales, including maintenance, were up only 2.3 percent.

The NLA pointed to several factors for the slowdown: Wall Street fluctuations that caused many layoffs, continued high unemployment in some areas and early winter 1989 freezes.

Southeast. Slowing growth everywhere but Florida. NLA's survey reports an overall growth of 29.1 percent in total landscape sales for 1989. Overall, sales, including maintenance, were up 16.3 percent.

Outlook: Hurricane Hugo devastated the Charleston, S.C., area. Demand for landscaping there should be high but it will takes years for the area to recover.

Midwest (Great Lakes). A resurgence. Factories are making a comeback. The farmbelt got an economic boost with worldwide demand for U.S. grain up more than 35 percent last year. Total landscape sales reflect the brightening economic picture in this area—

continued on page 12

1989 ACTUAL BUSINESS
Change from 1988

Region	Total Gross Sales	New Residential	New Commercial	Residential Renovation	Commercial Renovation	Residential Maintenance	Commercial Maintenance
Northeast	+6.0%	−0.3%	−1.8%	+5.5%	+1.3%	+2.7%	+1.3%
Southeast	+29.1%	+21.9%	+19.1%	−2.7%	−0.8%	**	+19.8%
Great Lakes	+20.3%	+10.8%	+14.6%	+12.7%	−3.0%	+11.7%	+9.1%
Great Plains	+18.6%	+3.5%	+5.0%	+20.0%	**	**	**
Survey avg.	+16.1%	+7.1%	+6.9%	+8.9%	−0.1%	+7.0%	+7.5%

1990 EXPECTED BUSINESS
Change from 1989

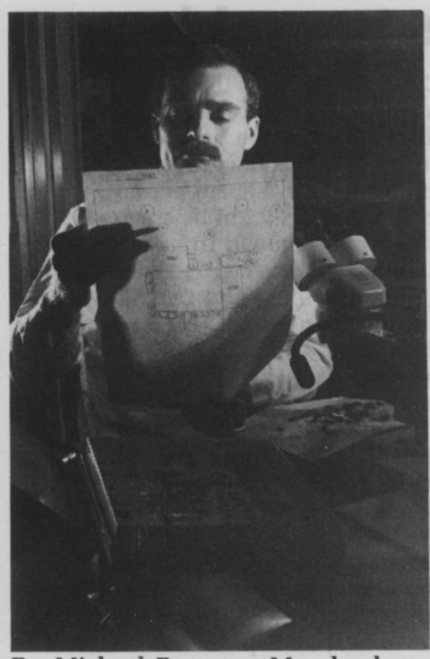
Region	Total Gross Sales	New Residential	New Commercial	Residential Renovation	Commercial Renovation	Residential Maintenance	Commercial Maintenance
Northeast	+13.0%	+5.2%	−2.4%	+18.7%	+5.8%	+14.7%	+13.7%
Southeast	+26.5%	+18.2%	+19.4%	+8.8%	+6.0%	**	+11.1%
Great Lakes	+16.9%	+11.7%	+14.6%	+14.1%	+3.7%	+17.6%	+10.7%
Great Plains	+16.8%	+5.0%	+12.3%	**	**	**	**
Survey avg.	+16.7%	+9.8%	+7.9%	+15.3%	+5.1%	+16.1%	+12.3%

**not enough responses

Source: National Landscape Assn.

RESERACH

Maryland researchers refine IPM techniques



Dr. Michael Raupp, a Maryland extension entomologist, inspects a landscape diagram identifying pest/plant symptoms. Such diagrams can help develop site-specific IPM.

COLLEGE PARK, Md. — Researchers at the University of Maryland are concentrating on effective integrated pest management (IPM) techniques for the green industry.

Dr. John Davidson directs a landscape IPM program for newly-installed corporate building landscapes. He is evaluating plant/pest systems, recommending corrective measures and developing an IPM program for landscape managers.

"With the large number of office buildings springing up around the state, we felt this was an important area to focus on," Davidson notes.

Davidson also cooperated with eight nurseries, showing that an IPM program based on frequent monitoring, evaluation and spot spraying provides equal or better plant protection than traditional practices. "One nurseryman cut his pest control costs by about $6,000 while reducing pesticide use by 96 percent," says Davidson.

Another urban entomologist, Dr. Michael Raupp, recently completed a three-year project with the National Park Service at historic sites like Fort McHenry, the battlefields at Gettysburg and Independence Mall.

"Basically, we assisted Park Service personnel in implementing an approach that will protect important ornamental plants while reducing the loss of beneficial insects," Raupp says.

He and graduate student Nancy Owen hope the project will have long-term benefits for the Park Service, landscape managers and home gardeners. A document being written by Owen will offer guidance on how to use IPM at park sites and managed landscapes. □

LANDSCAPING

California's landscapers take advantage of drought

SACRAMENTO, Calif. — Landscape contractors in this drought-riddled state are taking advantage of the lack of water this year to further service customers' lawns and landscapes.

Walter Barrows' company in Santa Barbara, where lawn watering is restricted, is using green paint on brown, dormant turf.

"California's rainy season really ends in April," notes Larry Rohlfes, communications director for the California Landscape Contractors Association (CLCA). "So we don't expect any more rain until fall this year."

The CLCA's position on water states, in part: "The key is efficient irrigation management. Far more water can be saved by improved irrigation management than by other water-conserving landscape practices."

Rohlfes says that the CLCA has been busy disseminating water-saving hints to the public through the mass media.

"This is the fourth year of drought," notes horticultural extension agent Janet Hartin of San Bernardino County. "People are beginning to water more intelligently—in the morning and on a schedule. We've put together a lawn watering guide for homeowners with minimums and forty commonly-asked questions and their answers.

"We are all in total agreement out here: do the grunt work on your irrigation system and save 10 to 20 percent of your water." □

Real or artificial?

KANSAS CITY, Mo. — It's real, explains turf expert George Toma (left, with Jonathan Harmer of Great Britain). Noting that dirt tends to accumulate in artificial turf, Toma decided to sow some Ph.D. ryegrass into the mat and dust it lightly with sand. The pre-germinated seed sprouted within four days and is nourished with Bov-A-Mura organic fertilizer and Ferromec liquid iron. The real grass/turf mat can be playable within a couple weeks, after which a high pressure hose can be used to blast the grass out, says Toma. This novel grass-growing approach is one of several possibilities for re-turfing artificial surfaces to meet the World Cup Soccer standards.

GOLF

Golf courses offer answers to problem

PEBBLE BEACH, Calif. — The golf industry needs to convince the public that golf is part of the solution to environmental problems, not part of the problem, says Perry Dye, president of the Golf Course Builders of America.

"Whether it's building environmental habitat or taking care of water problems, golf courses are part of the solution, not part of the problem," says Dye.

"The studies we need to compete in today's environmental arena have to be three to five years old, they have to be very well documented, and they're very expensive," says Dye. "The environmentalists have spent the money, so we're behind in our research in order to provide that one piece of information that proves that golf courses are part of the solution."

Dye says an important "buzzword" in 1990s will be "spoon-feeding."

"I think spoon-feeding through irrigation is something that's going to help us in the future," he says. "We need to spoon-feed our grasses instead of using heavy applications and do soil balancing and soil mixing at the time of construction. Sites will then be environmentally safe for a long, long time and require less chemicals for maintenance."

Dye notes reports from Japan that more than 90 caddies have developed skin problems and rashes due to mis-application of pesticides. Such incidents demonstrate the need to export our knowledge of turf management.

NO MATTER WHAT YOUR NEEDS..
WE HAVE IT IN SOLUTION

GROWTH PRODUCTS

LIQUID PROFESSIONAL FERTILIZERS AND **MICRONUTRIENTS** are formulated for your special turf and horticultural needs.Our products make it **EASIER** for you to **SPOON FEED** special areas like Tees and Greens or **SOLVE DEFICIENCY PROBLEMS.** Take one minute to look over our product line . . .

Our complete balanced blend with methylene ureas for slow release nitrogen and micronutrients.

Growth Products *Liquid Professional Fertilizers* are exclusive products manufactured with only the highest quality materials to assure the *BEST RESULTS* for your turf and horticultural programs. Our products are *TRUE SOLUTIONS*.

. . . . AND CALL US ON OUR TOLL FREE NUMBER FOR OUR CLOSEST DISTRIBUTOR OR TO DISCUSS YOUR PARTICULAR NEEDS . . .

Available in all size containers, 55 gal. drums and bulk deliveries.

GROWTH PRODUCTS LTD.
1-800-648-7626
914-428-2517 in NY
FAX: 914-428-2780
P.O. Box 1259
White Plains, NY 10602

Circle No. 110 on Reader Inquiry Card

management.

"Today it's a major sales job on our behalf to prove that we're part of the solution, not part of the problem," says Dye. "I'm an eternal optimist. I think we've done major things for the environment. It's a major give-and-take today, and we give up a lot more than we get to take, but we have to be perceived as part of the solution." □

ACADEMIA

Japanese visit Virginia Tech

BLACKSURG, Va. — The turfgrass research and Extension programs at Virginia Tech and Michigan State Universities were recently shown to a contingent of 30 turfgrass professionals from Japan.

Among the group visiting was Dr. Yoshisuke Maki, past-president of the International Turfgrass Society. Others included Japanese academics, industrialists, golf club owners and golf course superintendents. □

EQUIPMENT

Haul Master buys vehicle maker

MENDOTA, Ill. — Haul Master, Inc. has acquired C.H.I. Industries, an original equipment manufacturer of general-purpose utility vehicles.

Claude W. Martinez, president of Haul Master, says the acquistion brings enhanced engineering and manufacturing support to Haul Master's established product line of rugged, dependable, and economical utility vehicles.

C.H.I. Industries' operation has been combined with Haul Master's manufacturing facilities in Mendota, Ill. □

Moving?

Be sure to let us know your new address. Please enclose a complete address label from one of our recent issues.

ORTHENE® Turf, Tree & Ornamental Spray keeps pests out of your club.

Stop pests from playing a round on your course with ORTHENE Turf, Tree & Ornamental Spray. One treatment provides a broad spectrum of protection for turf as well as a wide variety of trees and ornamentals.

ORTHENE kills quickly on contact, then by systemic action. So you'll keep hard-to-kill pests like mole crickets, armyworms and leafhoppers under control. ORTHENE supplies long-lasting residual action against other insects including tent caterpillars, aphids and thrips.

ORTHENE Turf, Tree & Ornamental Spray. It's more than enough to drive unwanted pests right off your course.

ORTHENE®
Turf, Tree & Ornamental Spray

Avoid accidents. For safety, read the entire label including precautions. Use all chemicals only as directed. Copyright © 1990 Valent U.S.A. Corporation. All rights reserved. ORTHENE is a registered trademark of Chevron Chemical Co.

VALENT.

Circle No. 134 on Reader Inquiry Card

PEOPLE

Dr. Wilkinson new at Lawnmark

Dr. James F. Wilkinson has been appointed to the position of chief operating officer of Lawnmark, an Ohio-based lawn care company. "Jim brings to us experience, perspective, and understands our industry and the challenges it faces for the 90s," says **J. Martin Erbaugh**, president and chairman. "Everyone who knows the green industry respects him. I'm glad he's now on our team."

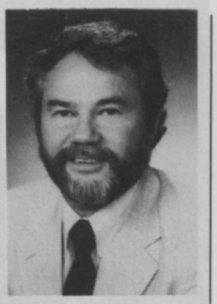
Wilkinson most recently served as the executive director of the Pesticide Public Policy Foundation. He is a past-president of the Professional Lawn Care Association of America.

Rutgers loses Indyk to Turfcon

As of June 30, **Dr. Henry Indyk** leaves behind 30 years on the faculty of Rutgers University to join Turfcon professional turfgrass consultants, a recently-formed division of GSI Consultants.

Dr. Wilkinson

Dr. Indyk



Evelyn Veere

Indyk will be Turfcon's chief agronomist, though he will continue work in the construction, renovation and maintenance of athletic fields and other sports turf facilities.

Indyk was the Irrigation Association's "Man of the Year" in 1978, elected to the New Jersey Turfgrass Hall of Fame in 1985, and has been general chairman of the New Jersey Turfgrass Expo for 16 years.

Changes for others in industry

Dr. Dave Shetlar has accepted a position with The Ohio State University as landscape entomologist.

Shetlar, who has been with ChemLawn for the past five years as research entomologist, began his duties May 1.

"I've really loved what I've done at ChemLawn and I really had to think about switching," said the former Penn State University professor.

Shetlar's appointment is 70 percent extension and 30 percent research.

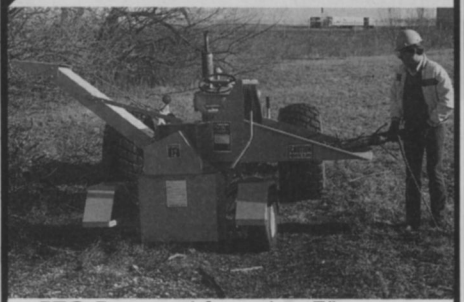
Rene H. Evelyn Veere has been appointed engineering scientist at Lyntone engineering, a consultant to Rain Bird Sprinkler Corp. "Rene has made outstanding contributions to the irrigation industry," says Lyntone vice president **James Shearer**. "He is truly the father of central control irrigation."

Meanwhile, at Rain Bird, **Don Clark** is new residential products manager, Turf Division. He will develop rotors, spray heads and micro-irrigation used in residential applications. □

Reduce Watering!
Olathe
Model 71/831 Aerator/ Polymer Planter

Plant water-absorbing polymer to reduce amount and frequency of watering. 48" swath with blades on 6" centers.
Call Your Nearby Olathe/Toro Dist. For Demo!
100 Industrial Parkway
Industrial Airport, KS 66031
913-782-4396
FAX: 913-764-1473

PTO Powered!
Olathe
Model 12 Tow Type Chipper



PTO Powered featuring 7" diameter capacity, spring loaded throwout clutch and a 500 lb. cutter drum. Reduces brush & limbs to a mulch chip.
Call Your Nearby Olathe/Toro Dist. For Demo!
100 Industrial Parkway
Industrial Airport, KS 66031
913-782-4396
FAX: 913-764-1473

Save On Watering!
Olathe
Model 891 Polymer Injector

Place water-absorbing polymer to extend watering intervals and aerate with a water reservoir around the root systems of plants, trees and shrubs.
Call Your Nearby Olathe/Toro Dist. For Demo!
100 Industrial Parkway
Industrial Airport, KS 66031
913-782-4396
FAX: 913-764-1473

Circle No. 127 on Reader Inquiry Card

You can get more powerful grub control than Chipco® Mocap® 5G.

But it gets lousy gas mileage.

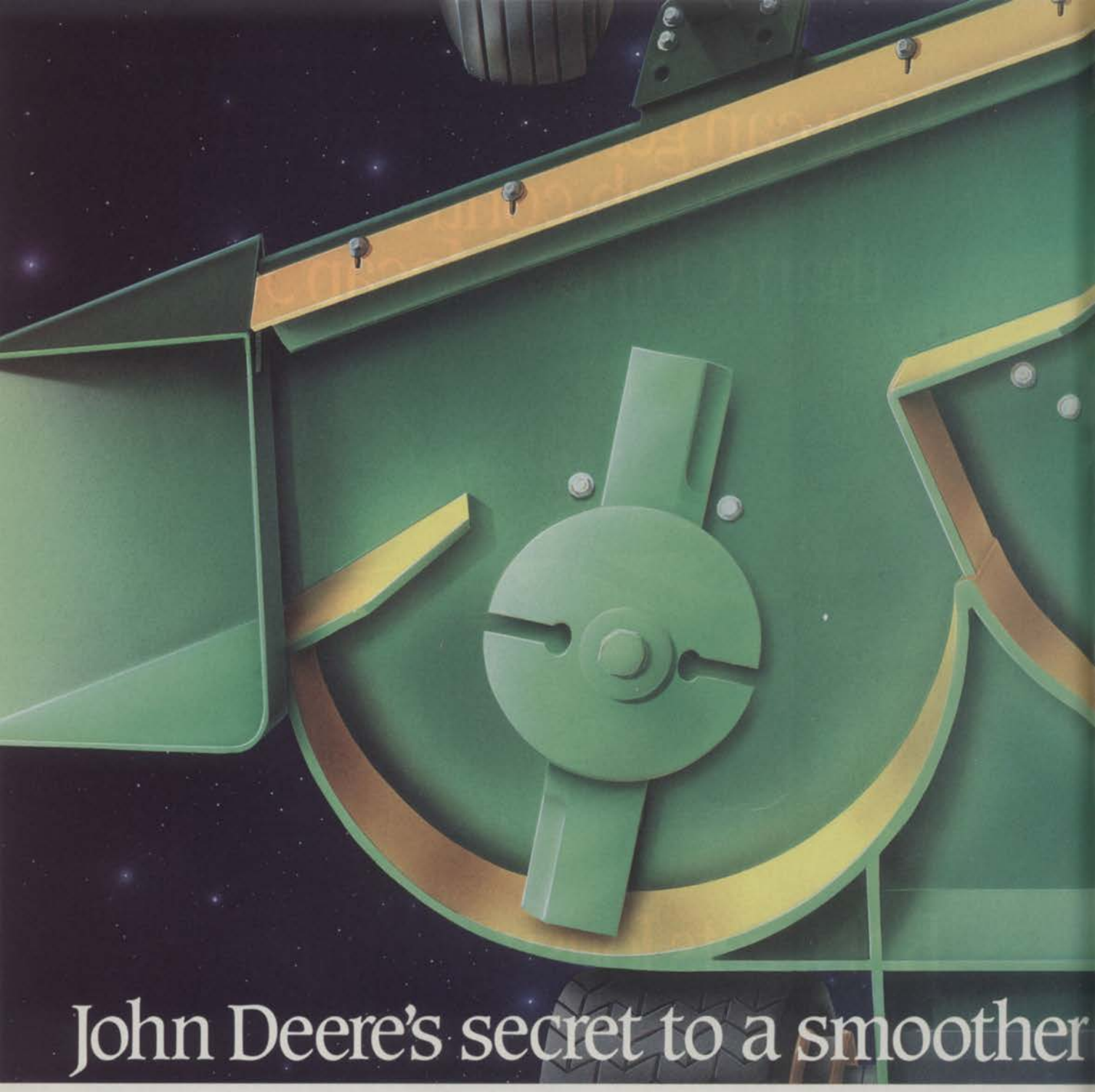
It's also tough to putt around. Fortunately, there's an easier solution, because the best grub control you can buy comes in a bag: CHIPCO® MOCAP® brand 5G pesticide. In fact, studies at a leading university show that CHIPCO® MOCAP® brand 5G delivers up to 97% effective control of white grubs. Plus, superior control of chinchbugs, sod webworms, bluegrass billbugs, black turfgrass Ataenius and mole crickets. And, you can use CHIPCO® MOCAP® brand 5G pesticide with confidence on nearly all types of turfgrass, including Bent, Bahia, Bermuda, Centipede, Fescue, Kentucky Bluegrass, St. Augustine, Zoysia and Perennial Rye species.

Need another reason for choosing CHIPCO® MOCAP® brand 5G? Then, consider this: CHIPCO® MOCAP® brand 5G provides this outstanding control for up to five full weeks. That saves time, trouble and money. So, let the Army worry about gas mileage. Get the most effective grub control money can buy with CHIPCO® MOCAP® brand 5G pesticide. Available at your turfcare chemicals supplier today.

Chipco® Mocap® 5G
Brand Pesticide

RHÔNE-POULENC

As with any crop protection chemical, always read and follow instructions on the label. CHIPCO and MOCAP are registered trademarks of Rhone-Poulenc. © 1990 Rhone-Poulenc Ag Company



John Deere's secret to a smoother

There's really nothing complicated about the reason John Deere commercial walk-behind mowers deliver such a smooth, even cut.

The whole idea of baffling, in fact, is really quite simple. Control the force and flow of air under the deck and you've gone a long way toward controlling the quality of cut.

Heavy-duty transaxle with cut gears provides five speeds, plus reverse.

Contoured baffles around the blades on our 48- and 52-inch mowers lift grass uniformly so the three offset blades can give it a manicured cut.

Large baffles in the front of the V-shaped deck can be lowered to minimize blowout in dry mowing conditions. Or moved up to maximize productivity in tall grasses.

A 12.5- or 17-hp Kawasaki engine is available, depending on model.

There's really nothing complicated about John Deere controls either. All are conve-

cut is so simple it's baffling

niently located at your fingertips. Steering levers. Individual brake controls. 5-speed transmission. Mower blade and traction drives.

And nothing could be simpler or more reassuring than John Deere product support—undeniably the best in the industry. Expert service and repair. Plus a computerized parts system that usually delivers overnight.

For quality commercial mowing, the choice is quite simple. See your John Deere dealer for more information. Or call 1-800-544-2122.

Choose a 32- or 36-inch mower. Or the 48- or 52-inch model shown at right.

JOHN DEERE

Nothing Runs Like a Deere®

SAFETY live with it

Circle No. 107 on Reader Inquiry Card

DYNAMIC DUO.

Lebanon Pro 20-3-5 with DURSBAN*

What two products have teamed up to lead the crusade against insect pests? It's Lebanon Pro 20-3-5 with 1 percent DURSBAN — a new and improved fertilizer/insecticide formulation. We've taken our 20-3-5 fertilizer base, with four units of sulfur-coated, slow-release urea and added a higher concentration of DURSBAN, a time-tested and effective insecticide. So you can get early green-up and sustained feeding while controlling surface and soil insects — without the time-consuming efforts of two applications. And for straight granular insect control, try Lebanon DURSBAN 2.32 percent. From your source for premium quality turf products.

Lebanon
TOTAL TURF CARE
A division of Lebanon Chemical Corporation

800-233-0628

*DURSBAN is a Registered Trademark of The Dow Chemical Company.

Circle No. 114 on Reader Inquiry Card

SHORT CUTS

ALIVE, BUT HOLDING... The Pesticide Public Policy Foundation (3PF), for the time being, will not have a new director. That was the decision of its board of directors in May. **Dr. James Wilkinson** left as director of 3PF to become the CEO of Lawnmark in mid-spring. "3PF will continue as an entity though," says assistant director **Paul Skorupa**, who will man the 3PF phone (401/294-6133). Skorupa says the 3PF will focus on the activities of its State Affairs Committee which is drafting policies for materials recycling, containment, mixing and loading.

PGMS SCHOLARSHIP...applications are being accepted until July 15. Anyone interested in applying should contact PGMS at 10402 Ridgland Rd., Suite 4, Cockeysville, MD 21030; or call (301) 667-1833.

SOOTY HATS?..."The public will respond to people in white hats doing good things, but I think our white hat has gotten a little soot on it," says **Jim Brooks**, executive vice-president of the Professional Lawn Care Association of America (PLCAA). Brooks, speaking to executives at Sandoz Crop Protection, continued: "In July 1986, Dan Rather launched us into the era of defending ourselves against pesticide controversy. We're going into the decade of the environment, and a lot of education will have to be done in a lot of different areas. We have to try to reinforce the benefits of lawn care and deal with the safety issue."

A FLYING START... The Guelph (Canada) Turfgrass Institute's $1.5 million fund-raising campaign has gotten off to a flying start. **George M. (Mac) Frost** and his wife **Beth**, who have owned and operated golf courses in the Toronto area since 1946, have donated $500,000. Frost says that the donation "is the result of a long-term involvement in turf and greens maintenance and an appreciation of the importance of ecologically sound turf research and practices."

MORE PESTICIDES... The dollar value of shipments by the pesticide industry is projected to grow nine percent annually until the year 2000, says a "Leading Edge" report. However, roughly two-thirds to one-half of this growth will be inflationary. Non-agricultural use of pesticides will grow to 38 percent of total dollar use in the next 10 years, the study notes, up from 29 percent in 1990. For more information, call Leading Edge Reports at (216) 791-5500.

New! Operator presence controls help ensure safety.

Improved hand controls are easier to operate.

New! Five-gallon plastic gas tank for fewer fill-ups and greater productivity.

Improved deck offers better cut performance.

Improved transmission offers a smoother, more comfortable walking speed.

Look what's new for 1990!

The LESCO 36 and 48 Commercial Rotary Mowers keep moving ahead to keep pace with your needs. Just count our new features and improvements, including a new nylon grasscatcher with three-bushel capacity. Plus your choice of Kawasaki or Kohler engine! It all adds up to a better mower.

To learn more about what's new for 1990, visit your nearest LESCO Service Center or call toll free **(800) 825-3726.**

LESCO

LESCO, Inc.
20005 Lake Road
Rocky River, Ohio 44116
(216) 333-9250

Watch for our new 32″ rotary mower!

Circle No. 115 on Reader Inquiry Card

EVENTS

JUNE

19-20: Jacklin Seed Company, Discovery Tour, Post Falls, Idaho. Contact: Jacklin Seed Company, (208) 773-7581.

20: Midwest Sports Turf Institute, College of DuPage, Glen Ellyn, Ill. Contact: Sports Turf Managers Association, (714) 981-9199 for registration; Tim Leverich, (708) 858-6112 for trade show/demo area.

21: Turf-Seed, Inc. Field Day. Contact: Turf-Seed Inc., P.O. Box 250, 3017 G St., Hubbard, OR 97032; (800) 247-6910.

21: University of California/ Riverside Tree Troubleshooting Seminar. Contact: Hartley Bennett, P.O. Box 414, Wickenburg, AZ 85358; (602) 684-7308.

21: University of Massachusetts Turfgrass Research Field Day, Research Center, South Deerfield, Mass. Contact: Dr. Richard J. Cooper. Dept. of Plant and Soil Sciences, University of Mass. 01003; (413) 545-2353.

22-24: Trees in the Urban Forest Workshop, Research Triangle, N.C. Contact: American Society of Consulting Arborists, 700 Canterbury Rd., Clearwater, FL 34624; (813) 446-3356.

25-26: Northwest Turfgrass Association Summer Turfgrass-Fest. Contact: NTA, P.O. Box 1367, Olympia, WA 98507; (206) 754-0825.

25: Atlantic Seedmen's Association summer membership meeting, Hyatt Grand Cypress Hotel, Orlando, Fla. Contact: Dr. John E. Baylor, 298 McCormick Avenue, State College, PA 16801; (814) 237-0330.

27-July 14: Landscape Architecture Tour of Europe. Contact: UCLA Extension, Landscape Architecure Program, 10995 LeConte Ave., Suite 414, Los Angeles, CA 90024.

JULY

12-16: A.A.N./Tennessee Nurseryman's Association annual convention in Nashville, Tenn. Contact: American Association of Nurserymen, (202) 789-2900.

18: Maryland Turfgrass Field Day, Silver Spring, Md. Contact: Peter Dernoeden, Dept. of Agronomy, University of Maryland, College Park, MD 20742; (301) 454-3717.

IT'S TIME FOR AN ASSAULT ON LYME DISEASE.

Authorized Damminix Distributors as of May 1, 1990*:

Connecticut
Nutrico
Shemin Nurseries

Massachusetts
New England Arborware
Shemin Nurseries

New Jersey
Grass Roots Turf Products
Monmouth Feed Supply
Northeast Vector Mgmt.
PCO Supply
York Chemical

Pennsylvania
American Arborist Supply
Fisher and Son
Shemin Nurseries

Wisconsin
Reinders Brothers
Spring Valley Turf Products

Or Call
1-(800)
234-TICK

* Stocking Damminix - FOR PROFESSIONAL USE

Damminix is registered by the EPA and in all states in which Lyme disease is a significant problem.

Circle No. 108 on Reader Inquiry Card

LETTERS

Pebble Beach is not only host

To the editor:

The article entitled "Tournament-Level Manager" (January 1990) provided an interesting insight into country club management. Your interview with D.J. Pakkala, director of golf course operations for Pebble Beach Company, offered a candid look at the complexity of providing high quality golf courses.

In one part of your article you mentioned that Pebble Beach is the only public course in the U.S. to hold a major professional tournament. To set the record straight, I know of at least one other golf course that has been host to several major tournaments.

Keller Golf Course in St. Paul, Minn., a public course owned and operated by the Ramsey County Parks and Recreation Department, has been a major attraction to both the PGA and LPGA tours. Keller was home to the St. Paul Open from 1930-1968 as a regular stop on the men's tours. Keller was home to the St. Paul Open from 1930 to 1968 as a regular stop on the men's tour.

The Patty Berg Golf Classic was an LPGA event at Keller from 1973-1980. Keller also hosted the Western open in 1949 and the Men's National PGA Championship in 1932 and 1954.

Keller Golf Course does not have the same national exposure as Pebble Beach, but it nonetheless is as rich in tradition. Recent grounds renovation and clubhouse remodeling projects at Keller will make it a golf course that again attracts major tournaments.

Landscape Management magazine is required reading for the superintendents and park supervisors in our department. Our staff enjoys the variety of information provided through the diverse articles written. It is always good to read about how others are managing their landscapes. Your magazine is a valuable learning tool in our business.

Keep up the good work.

Kevin C. Finley
Ramsey County Parks & Recreation
Maplewood, Minn.

(Thanks for the correction and compliments. Since that article was published, D.J. Pakkala has moved on. He is now associated with International Golf Management, the management group for International Golf Partners. The company plans to develop high-prestige, business-oriented golf courses in major U.S. business centers.—ED.)

BANOL®

Stops Pythium disease before it starts . . . or even after it's started

If you want to head off the major turf losses that can result from Pythium blight and damping-off, hire on BANOL® fungicide. Then simply apply it every 7 to 21 days when conditions are favorable for disease development. But what can you do if Pythium is already damaging your turf? Apply BANOL at the higher rates, and you'll soon have destructive Pythium diseases under control.

Unlike less-effective contact fungicides that can quickly be washed off by rain or irrigation, BANOL is systemic, so it keeps on working. BANOL is a key component in your resistance management rotation schedule. It is non-phytotoxic, non-leaching and compatible with other fungicides and insecticides.

NOR-AM
NOR-AM CHEMICAL COMPANY
A Schering Berlin Company

Copyright © 1989 NOR-AM Chemical Company. All rights reserved.

3509 Silverside Road. P.O. Box 7495, Wilmington, DE 19803

IMPORTANT: Please remember always to read and follow carefully all label directions when applying any chemical.

Circle No. 125 on Reader Inquiry Card

COVER STORY

MANAGING AQUATIC WEEDS

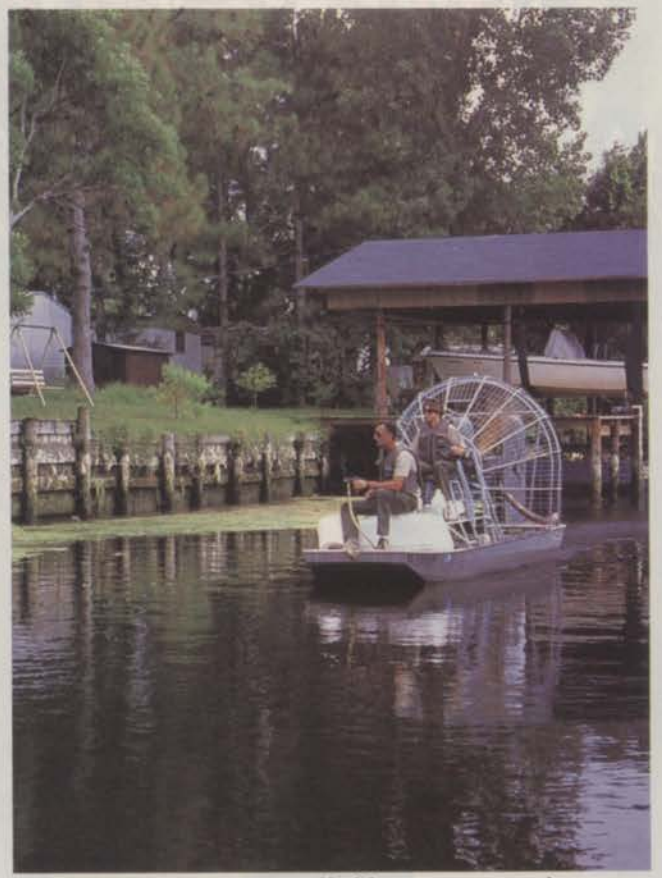
A challenge of the '90s will be to achieve a realistic balance between habitat requirements and the public's concern for recreational access and lake aesthetics.

by Joe Hinkle, Florida Dept. of Natural Resources

Aquatic vegetation growth can be one of the most frequent and frustrating problems associated with living on or near a body of water.

Plant or algae growth can be seen as destroying the aesthetic value and health of a body of water. While this is sometimes true, a little public and professional education on the value and importance of aquatic habitat could eliminate many perceived "weed" problems.

In natural bodies of water, several hundred species of native plants rarely produce population levels that would be considered a nuisance. These aquatic plants and algae function as primary food producers and, in natural systems, should cover 10 to 40 percent of a water body to provide optimum habitat for fish and wildlife.



Filamentous algae is controlled by copper complex, diquat dibromide, simazine, endothall and triploid grass carp.

Ideal vegetation

The ideal vegetation coverage would have intermediate native plant densities and be composed of a high diversity of submersed and emergent plants, with some planktonic algae present in the water column.

Yet even "good" aquatic plants become weeds when their populations become detrimental to fish and wildlife or restrict the intended use of a water body. Defining excessive plant growth depends on many factors, such as type of water body, intended use and geographic location.

The major causes of aquatic weed infestations include:

New plant species. Preventing the introduction of new plant species is the most important factor in weed management.

Many times these species dramatically expand their populations due to the lack of natural enemies that would normally regulate excessive plant growth. In addition, these exotic plants usually have growth adaptations that allow them to out-compete the native species.

This loss of native plant diversity through "unfair" competition results in an unstable monoculture that is not beneficial to fish, wildlife or use of the resource.

Encourage homeowners to leave native shoreline vegetation alone. Clearing the shoreline may promote less beneficial exotic plants that are usually more difficult to manage. And tell them about the potential problems of introducing exotic plants to the lake.

Inorganic fertilizers, organic litter and other pollutants introduced through poor watershed drainage patterns can contribute to uncontrolled plant growth. Berms and swales can be used around the shoreline to trap nutrient sources before they reach the water body.

Organic pollutants. Other sources of organic fertilizers for plant and algae growth are waste products from domestic animals in rural areas and domestic waterfowl in urban locations.

Lack of wind. Artificially-created waters should be built with the long axis of the pond oriented to take advantage of prevailing winds. This will provide natural aeration and discourage floating plants. Water bodies surrounded by extensive areas of brush and trees hinder natural wind aeration and can encourgae species such as duckweed.

Shoreline vegetation. Increasing the slope of land banks can discourage shoreline vegetation, and overall deeper water depths will discourage growth of submersed plants.

Poor fish management. Improperly conducted fish management practices such as pond fertilization, liming, overfeeding and overstocking can increase available nutrients, resulting in accelerated plant growth.

TABLE 1.

PROBLEMS ASSOCIATED WITH EXCESSIVE PLANT GROWTH

*Restricts recreational and navigational pursuits
*Decreases sportfish harvest
*Stunts sunfish populations
*Interferes with largemouth bass and bluegill feeding
*Increases cannibalism in largemouth bass
*Increases susceptibility of largemouth bass to anglers
*Causes extreme daily fluctuations in temperature, oxygen and pH, which can result in fish kills
*Reduces revenue because of decreased recreational use and a perceived decrease in property values by lakefront property owners

BENEFITS OF A MAINTENANCE PROGRAM

*Less use of herbicides in chemical programs
*Reduction in management costs
*Less organic matter decomposition on the lake bottom
*Reduction in complaints from the public
*Increased recreational use and revenues
*Reduction of environmental impacts associated with excessive plant growth

BENEFITS OF A QUALITY ENVIRONMENT

*An abundance of invertebrate foods such as insects, snails, grass shrimp
*More small fish
*Increased survival of young-of-the-year largemouth bass
*Increased sport fish population
*More spawning areas for certain fish species
*Oxygen production
*Sediment stability
*Food and cover for waterfowl

Having exhausted all the possibilities for prevention—or at least limiting the factors that contribute to weed problems—the next step is to develop a management strategy. Since it is usually impossile to eliminate "weed species," the next-best solution is low-level maintenance of these plants.

Known nuisance exotic plants should be managed as soon as they are detected in a water body. However, native species should be managed only when they reach populations which restrict navigation, the intended use of the water, or are a bio-

Granular herbicide applied to hydrilla plants.

Aquatic troops serve the biological battle plan

Native aquatic plants have natural biological deterrents which normally regulate plant growth. The best biological control program would be to locate natural pests from their native region for each particular problem species.

Benefits of host-specific biocontrol agents include:

- Long-term control, which is not labor intensive;
- Elimination of non-target impact to beneficial plants;
- Reduced public apprehension by elimination of herbicide use.

Florida's best example of a successful bio-control agent is the alligator weed flea beetle (*Agasicles hygrophilia*), which has reduced that species from a major problem to a minor nuisance without impacting non-target habitat.

Agents released for water hyacinth control include two weevils (*Neochetina*), a fungus (*Cercospora*), and the water-hyacinth mite (*Orthagalumna*).

A weevil (*Neohydronomous affinis*) has recently shown promise for management of water lettuce, and will continue can be used. A permit is required in Florida as well as many other states. It may be prohibited entirely in some states.

Although the grass carp will not manage all species of aquatic plants, it can control a wide variety of species and, if stocked in sufficient numbers, is likely to remove all vegetation from a water body.

Benefits of grass carp control include low cost, little increase in algae, no unpleasant decaying vegetation, no water use restrictions and long-term control.

Adverse factors associated with a grass carp management program include minimal selection of plant species removed, loss of beneficial native plants, and the adverse effects of total elimination of submersed plants on fish populations.

Stocking rates for grass carp can vary from a few fish per acre to over 100 per acre depending on the management approach, plant type, plant biomass and the length of the growing season. —*Joe Hinkle*□

Control products are diverse, effective

Aquatic herbicides are the mainstay for many management programs, having the potential for relatively rapid control of many problem species.

Advantages of herbicide control include moderate cost, selectivity for site and plant type, and less elimination of vegetation.

Drawbacks to herbicide use include public apprehension of chemicals, water-use restrictions, nutrient release into the water, unpleasant appearance from decaying vegetation, and in a few cases, toxicity to non-target organisms.

Major herbicides used in aquatic plant control include copper sulfate, copper complexes, 2, 4-D, diquat dibromide, endothall, glyphosate, fluridone, simazine and dichlobenil.

Table 3 provides a listing of the major companies which can be contacted to provide current labeling information. Since many companies may not normally provide special local need labeling, it is advisable to specifically request it for your region.

Environmental factors such as water temperature, pH, carbonate hardness, turbidity, and water movement can have consequential effects on both efficacy and toxicity to non-target organisms.

The contact herbicides diquat dibromide, copper, and endothall are usually recommended to be used when temperatures are a minimum of 60°F. The systemic 2,4-D can be effective at lower temperatures but the rate normally is increased to offset slow plant growth. Labeling for simazine products recommend treatment before 75°F to avert fish kills resulting from low oxygen levels from rapid dieoff of vegetation.

Uptake of 2,4-D and Rodeo is more effective at a pH of around 6; uptake decreases as pH rises.

Toxicity and efficacy of copper sulfate increases as carbonate hardness drops below 50 ppm; however, the complexes of copper are not as susceptible to hardness level variations.

The use of diquat dibromide should be avoided in areas of high turbidity due to reduced herbicide activity from the product being tied-up on mud and clay particles.

—*Joe Hinkle*□

TABLE 2.

PLANT SUSCEPTIBILITY

Plant	Copper Complex	Diquat Dibromide	Amine 24D	Ester 24D	Simazine	Fluridone	Dichlobenil	Glyphosate	Endothall	Triploid Grasscarp
Algae, Filamentous	•	•			•				•	•
Algae, Planktonic	•	•	—	—	•	—	—	—	•	—
Alligator Weed	—	—	•	•	—	•	•	•	—	—
Arrowhead	—	—	•	•	—	•	—	—	—	•
Azolla	—	—	—	—	—	•	—	—	—	•
Banana Lily	—	—	—	—	—	—	—	—	—	•
Barnyard Grass	—	—	—	—	—	•	—	•	—	—
Bladderwort	—	•	—	•	—	•	•	—	—	•
Bog Moss	—	—	—	—	—	—	—	—	—	•
Bullrush	—	—	•	•	—	•	—	—	—	—
Bureed	—	—	—	—	—	—	—	—	•	—
Cattail	—	•	•	—	—	•	•	•	—	•
Chara	•	—	—	—	•	—	•	—	•	•
Coontail	—	•	—	•	•	•	•	—	•	•
Cut-Grass, Giant	—	—	—	—	—	•	—	•	—	—
Duckweed, Lemna	—	•	•	•	•	•	—	—	—	•
Eel-Grass	—	—	—	—	—	•	•	—	•	—
Elodea	•	•	—	—	—	•	•	—	•	•
Fanwort	—	—	•	•	•	—	—	—	—	•
Frog's-Bit	—	—	•	—	—	—	—	—	—	—
Hydrilla	•	•	—	—	—	•	•	—	•	•
Hygrophila	—	—	—	—	—	—	—	—	—	•
Loosestrife, Purple	—	—	—	—	—	—	•	•	—	—
Lotus, American	—	—	—	—	•	•	—	•	—	—
Maidencane	—	—	—	—	—	•	—	•	—	•
Milfoil	—	•	•	•	•	•	•	—	•	•
Naiad	•	•	•	—	•	•	•	—	•	•
Nitella	•	—	—	—	—	—	—	—	—	•
Nutsedge	—	—	—	—	—	—	—	•	—	—
Paragrass	—	—	—	—	—	•	—	•	—	—
Parrot-Feather	—	—	•	•	—	•	—	—	—	—
Pennywort	—	•	•	•	—	—	•	—	—	—
Phragmites	—	—	—	—	—	—	—	•	—	—
Pickerelweed	—	—	•	•	—	—	—	—	—	•
Pondweed	—	•	—	—	•	•	•	—	•	•
Salvinia	—	•	—	—	—	•	—	—	•	•
Smartweed	—	—	•	•	—	•	—	•	—	—
Spatterdock	—	—	—	•	—	•	•	•	—	—
Spikerush, Slender	—	—	•	—	—	•	—	—	—	•
Torpedo Grass	—	—	—	—	—	•	—	•	—	—
Vaseygrass	—	—	—	—	—	—	—	•	—	—
Water Chestnut	—	—	—	•	—	—	—	—	—	—
Water Primrose	—	—	•	•	—	•	•	•	—	—
Water-Grass, Southern	—	—	—	—	—	•	—	—	—	•
Water-Lettuce	—	•	—	—	—	—	—	•	•	—
Water-Meal	—	—	—	—	•	•	—	—	—	—
Water-Paspalum	—	—	—	—	—	•	—	—	—	—
Water-Shield	—	—	—	•	—	—	—	—	—	•
Water-Willow	—	—	—	—	—	•	—	—	—	—
Waterhyacinth	—	•	•	•	—	—	—	•	—	—
Waterlily, Fragrant	—	—	•	•	—	•	•	—	—	•
Widgeongrass	—	—	—	—	—	—	•	—	—	•
Willow	—	—	•	•	—	—	—	•	—	—

logical detriment to the system.

Program tools

The most important first steps in a management program are to (1) become familiar with the most common species of nuisance plants and (2) conduct regular inspections of the entire water body to provide early detection of these potential weed problems. Plant species will dictate the availability and effectiveness of control measures.

Plant identification is usually available through a state university, state conservation agency, or a county extension agent.

Mechanical harvesting of aquatic plants can be a highly selective method of management that provides immediate results, removes nutrients from the lake system and does not have water use restrictions associated with the operation. However, this type of control is usually time consuming, expensive, short term, has the potential to spread small infestations of troublesome exotics to other locations, and can result in loss of food fish and juvenile sport fish.

Harvesting disadvantages

The logistics and expense associated with commercially-made mechanical harvesters severely limit their compatibility with a small lake control program.

However, in small lakes, physical hand removal or cutting combined with early detection can be an effective and inexpensive way to control new infestations of floating plants (such as water hyacinth) or emergent plants (such as cattails).

Mechanical control may be the only available option for plant control in water bodies with a high degree of water exchange that may decrease herbicide contact time below minimum levels for efficacy.

A water control structure is a desirable feature to be designed into new water bodies. The feature should incorporate an overflow system which removes organic-rich and low oxygenated bottom water.

De-watering large sections of the lake bottom will solidify suspended mud and consolidate bottom sediments, which can improve fish spawn-

For Getting Rid of Grubs in Record Time, There's Nothing Faster Than Dylox.

DYLOX is a Reg. TM of Bayer AG, Germany. 75371 ©1989 Mobay Corporation

DYLOX® insecticide stops grubs in their tracks. Fast. Usually in less than 48 hours. And for the record, nothing on the market works better or faster.

Circle No. 118 on Reader Inquiry Card

DYLOX

Mobay Corporation
A Bayer USA INC. COMPANY

Bayer MOBAY

Specialty Products Group
Box 4913, Kansas City, MO 64120

Aeration benefits virtually unlimited

Aeration is a relatively new plant management technique that can be a preventive and/or control measure.

Eutrophication is a common problem associated with water bodies in urban areas. Aeration can help eliminate such undesirable characteristics as fish kills from oxygen depletion, blue-green algae blooms and odors.

One of the main functions of aeration is to eliminate thermal and dissolved oxygen stratification. Studies indicate that total lake aeration can also decrease water quality parameters such as pH, iron, hydrogen sulfide (rotten egg smell), total nitrogen, ammonia and turbidity. Dissolved oxygen concentrations in water near the bottom and water transparency increase with lake aeration.

Effective on blue algae

Aeration does not significantly change primary production of algae. However, aeration impact on oxygen, pH, temperature and alkalinity can result in population shifts from troublesome blue-green algae to a more diverse population of green algae.

Aeration is not a cure-all or quick fix to eutrophication and algae problems. Benefits from the process nay not be observed for more than a year after the program is begun, and may have to be continued for several years to maintain desirable results.

Aeration systems that are designed to deliver air to a grid or diffusers near the lake bottom are usually a more cost effective and efficient system than systems which agitate or move water.

—Joe Hinkle□

TABLE 3.

HERBICIDE COMPANIES

COMPANY	STREET ADDRESS	CITY	STATE ZIP CODE
A & V, Inc.	N62 W22632 Village Dr.	Sussex	WI 53089
Agrolinz, Inc.	1755 N. Kirby, Suite 300	Memphis	TN 38119-4393
Allstates Chemical Corporation	P.O. Box 619	Katy	TX 77449
American Cyanamid Company	P.O. Box 400	Princeton	NJ 08540
Applied Biochemists, Inc.	5200 West County Line Rd	Mequon	WI 53092
Aquacide Company	1627 Ninth Street	White Bear Lakes	KT 55110
Aquashade, Inc.	P.O. Box 198	Eldred	NY 12732
Bada Company	P.O. Box 1908	Casselberry	FL 32707
Certified Laboratories	P.O. Box 2493	Fort Worth	TX 76113-2493
Ciba-Geigy Corp.	P.O. Box 18300	Greensboro	NC 27419
Dow Chemical Company	P.O. Box 1706	Midland	MI 48640
E.I. DuPont De Nemours & Co., Inc.	Walker's Mill Building	Wilmington	DE 19898
Elanco Products Company	P.O. Box 708	Greenfield	IN 46140
Excel Chemical Co., Inc.	2385 Corbett. St.	Jacksonville	FL 32204
Great Lakes Biochemical Co., Inc.	6120 W. Douglas Ave.	Milwaukee	WI 53218
Griffin Corp.	P.O. Box 1847	Valdosta	GA 31603-1847
Inter-Ag Corp.	5100 Poplar Ave.	Memphis	TN 38137
Lesco, Inc.	P.O. Box 16915	Rocky River	OH 44116
Lubar Company	1700 Campbell	Kansas City	MO 64141
Walter International Corp.	P.O. Box 6099	New Orleans	LA 70174
Mantek	P.O. Box 660196	Dallas	TX 75266
Momar, Inc.	P.O. Box 19567 Station N	Atlanta	GA 30325
Monsanto Agricultural Products Co.	800 N. Lindbergh Blvd.	St. Louis	MO 63166
National Chemsearch	2727 Chemsearch Blvd.	Irving	TX 75062
Oxford Chemicals	P.O. Box 80202	Atlanta	GA 30366
PBI Gordon Corporation	P.O. Box 4090	Kansas City	MO 64101
Pennwalt Corporation	Three Parkway	Philadelphia	PA 19102
Rhone-Poulenc Ag Company, Inc.	P.O. Box 12014	Research Triangle	NC 27709
San-Mar Laboratorie	P.O. Box 93188, Martech Sta.	Atlanta	GA 30381
Sandoz Crop Protection Corp.	1300 East Toughy Ave.	Des Plaines	IL 60018
Selig Chemical Industries	840 Selig Dr. SW	17.3/19.9x36.10Atlanta	GA 30336
Sentry Chemical Company	P.O. Box 748	Stone Mountain	GA 30086
State Chemical Manufacturing Co.	3100 Hamilton Ave.	Cleveland	OH 44114
Tennessee Chemical Co.	3475 Lenox Road N.E. Ste 670	Atlanta	GA 30326
UniRoyal Chemical Co., Inc.	74 Amity Road	Bethany	CT 06525
Valent U.S.A. Corporation	1333 N Calif. Blvd. Ste. 600	Walnut Creek	CA 94596-8025
Van Water & Rogers, Inc.	Subs. of Univar, 2256 Junt.	San Mateo	CA 95131
Venus Lab., Inc.	855 Lively Blvd.	Wooddale	IL 60191

ing and decrease nutrient availability for plant growth.

Proper timing

Proper timing (fall-spring) and adequate exposure (1/2 to 2/3 of the lake) are necessary for an effective program. An improperly conducted program may encourage expansion of the present problems or allow new species to establish.

In conjunction with a drawdown program, burning the shoreline vegetation and dredging can be integrated into the program.

Burning is limited mainly to cattail, brush and other types of emergent plants. In many cases, it provides a more desirable cover along shorelines by encouraging grass species.

Lakes can be dredged to eliminate accumulated organic matter and restore original depth, while at the same time removing problem vegetation.

Revegetation of shoreline plant communities has become common in many parts of Florida as a result of mitigation programs, for simple aesthetic improvement, or for the enhancement of fish and wildlife habitat. Plantings can also help stabilize shorelines and provide competition to help restrain problem exotic species.

Aquascaping

In aquascaping, nursery stock of native plants (free from contamination by exotic species or problem native species) is preferred. Selection of plants from the wild should be limited to areas which are not infested

To the floating deck Crew King,™ this is a walk in the park.

- *Available in 36" and 48" cutting widths.*
- *Fixed deck units also available.*
- *Heavy duty 10 gauge decks with 7 gauge skirts.*
- *Rigid bumper system on fixed deck units.*
- *Powerful, 14 HP Kohler overhead valve, 4 cycle engine on floating deck models.*
- *Reliable, 12.5 HP Kawasaki engine on fixed deck models.*
- *Large, 4.25 gallon fuel tank to minimize refueling time.*
- *Top-lube, easy-access blade spindles for simple maintenance.*
- *Low profile, heavy duty caster struts for better access under bushes and benches.*
- *Long life, smooth casters for less turf marking.*
- *Double-A drive belts for better traction.*
- *Neutral starting safety controls.*
- *Floating decks have wide reinforcing bar on deck perimeter for strength and to prevent turf gouging.*
- *48" deck model has a center anti-scalp roller and skids for added turf protection.*

Smooth out your tough jobs with the new 36″ and 48″ Crew Kings.

For a better quality cut, a floating deck is suspended from the carrier frame, allowing the Crew King to follow ground contours closely and prevent scalping and blade damage.

For better productivity, the new Crew Kings are packed with time-saving features. Quick change cutting height adjustment requires little effort and no tools. Just pull a few pins, set the cutting height and continue.

Five forward speeds accommodate a wide variety of mowing conditions. Reverse gear makes access to tight areas easier, including trailer unloading. And a zero turning radius at the wheel provides excellent maneuverability without scuffing turf.

Crew Kings also have proven-tough Jacobsen decks, built to take the hard knocks of everyday work.

The new Jacobsen Crew Kings help turn any day into a walk in the park.

See your Jacobsen Commercial Products dealer today for a demonstration.

JACOBSEN
TEXTRON
Jacobsen Division of Textron Inc.

© 1990 Jacobsen Division of Textron, Inc.

Circle No. 111 on Reader Inquiry Card

J-10-0

WHY ADELPHI IS FIRST CHOICE WITH EXPERTS:

■ Tests prove it has superior overall turf quality ■ Excellent density, disease resistance & rich green color ■ Consistently outperforms many newer bluegrasses ■ Early spring and late fall color retention ■ Good tolerance to drought and close mowing ■ First choice with many sod growers, stadium, golf, park superintendents and other turf experts. Get full details in technical bulletin #10.

Adelphi
KENTUCKY BLUEGRASS
U.S. Plant Pat. No. 3150
THE GREENER KENTUCKY BLUEGRASS™

For more information contact:

J. & L. ADIKES, INC. Jamaica, NY 11423
JACKLIN SEED CO. Post Falls, ID 83854
NORTHRUP KING CO. Golden Valley, MN 55427
VAUGHN SEED CO. Bound Brook, NJ 08805 Downers Grove, IL 60515
ROTHWELL SEEDS LTD. Lindsay, Ont. CAN K9V 4L9

Circle No. 101 on Reader Inquiry Card

with non-native species, and which have adequate plant numbers to compensate for the loss of some. Commonly-used species include bullrushes, sedges, iris, cordgrass, canna, pickerelweed, arrowheads and waterlilies.

For the aquascaping program to be a success, the planted area has to be free of exotic plants and troublesome native plants such as cattails. This may require detailed herbicide application or simple hand removal.

Regulations and permits

Various state and federal agencies may regulate many of the aquatic plant manager's techniques and tools. In addition to following all the aspects of U.S. EPA labeling instructions for herbicides, there may be state agencies which regulate activities related to:

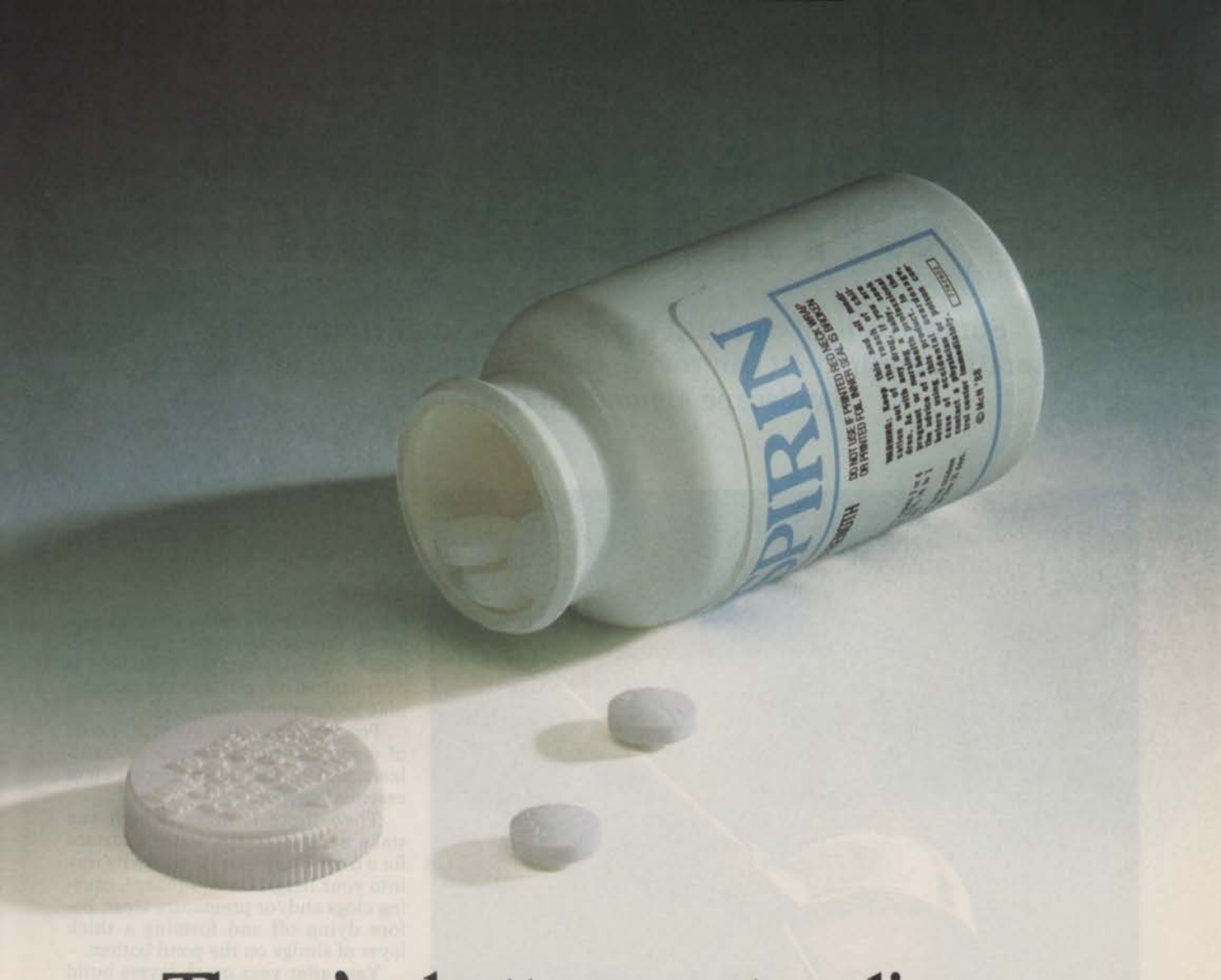
- Pond construction
- Lake drawdown
- Burning

Clearing the shoreline may promote the establishment of less beneficial exotic plants, which are usually more difficult to manage.

- Dredging bottom material associated with mechanical plant harvesting
- Herbicide use, record keeping, and labeling
- Certification of herbicide applicators
- Vegetation removal and planting
- Importation, cultivation or transporting aquatic plants
- Stocking of non-native fish

With existing management tools, the capability exists in many small and large lakes to eliminate all aquatic vegetation. The challenge of the '90s will be twofold. One, to resolve the question of what vegetation types and abundance are essential for a healthy environment. Two, to use plant management techniques to achieve a realistic balance between habitat requirements and the public's concern for recreational access and lake aesthetics. **LM**

Joe Hinkle is a biological scientist at the Bureau of Aquatic Plant Management, a division of the state of Florida's Department of Natural Resources.



There's a better way to relieve ornamental replacement headaches.

In fact, there are two ways to relieve ornamental replacement headaches caused by disease damage: CHIPCO® ALIETTE® and CHIPCO® 26019 fungicides. CHIPCO® ALIETTE® brand fungicide tackles Phytophthora root rot and Pythium with powerful systemic action that puts long-lasting control inside each plant. Plus, CHIPCO® ALIETTE® brand provides two-way disease protection: First, by directly attacking disease organisms; and then, by helping plants build up their own disease defense mechanisms. And for the broadest spectrum disease control you can buy, depend on CHIPCO® 26019 fungicide. One economical application of CHIPCO® 26019 provides lasting protection against 13 of the most damaging ornamental diseases. And CHIPCO® brand 26019 fungicide does not cause phytotoxicity problems. So, you can use it with confidence on the most sensitive varieties. This year, save the aspirin for other headaches. Cure ornamental diseases with the powerful fungicide team from CHIPCO®.

Chipco® Aliette®
Brand Fungicide

Chipco® 26019
Fungicide

RHÔNE-POULENC

As with any crop protection chemical, always read and follow instructions on the label. CHIPCO and ALIETTE are registered trademarks of Rhone-Poulenc. © 1990 Rhone-Poulenc Ag Company

Circle No. 129 on Reader Inquiry Card

REVIVE YOUR POND WITH AERATION

Summer's heat can turn a pond into a smelly, slimy well. Aeration equipment can revive them and provide an interesting landscape element in the process.

Beneath the calm, vitreous surface of your pond a battle will rage this summer. The fight is over limited oxygen, and the casualty may be the pond itself.

Ponds become the eventual home of organic pollutants, such as fertilizers, which leach in and deprive it of essential oxygen.

Then there is algae, which can stake a claim on the water's surface for a time. From there it works its way into your irrigation equipment, causing clogs and/or premature wear, before dying off and forming a thick layer of sludge on the pond bottom.

Year after year muck layers build and, unless checked, may fill up and kill a pond or lake through a process called eutrophication (see diagram).

Danger signals

The onset of warmer summer temperatures brings on increased concern of pond water quality. An early indicator of problems is fish kills, a sudden change in water color and/or the appearance of algal blooms.

"I can assure you that if a pond is in an area that has fertilized ground around it, it will develop algae, no ifs, ands or buts about it," says Doug Cramer, vice president of Air-O-Lator Inc.

Algae are phytosynthetic plants that need nutrients, sunshine and warm water for growth. When nutrient-rich waters, like those on golf courses or other maintained landscapes, are warmed by the summer sun, they become an ideal environment for algal explosion.

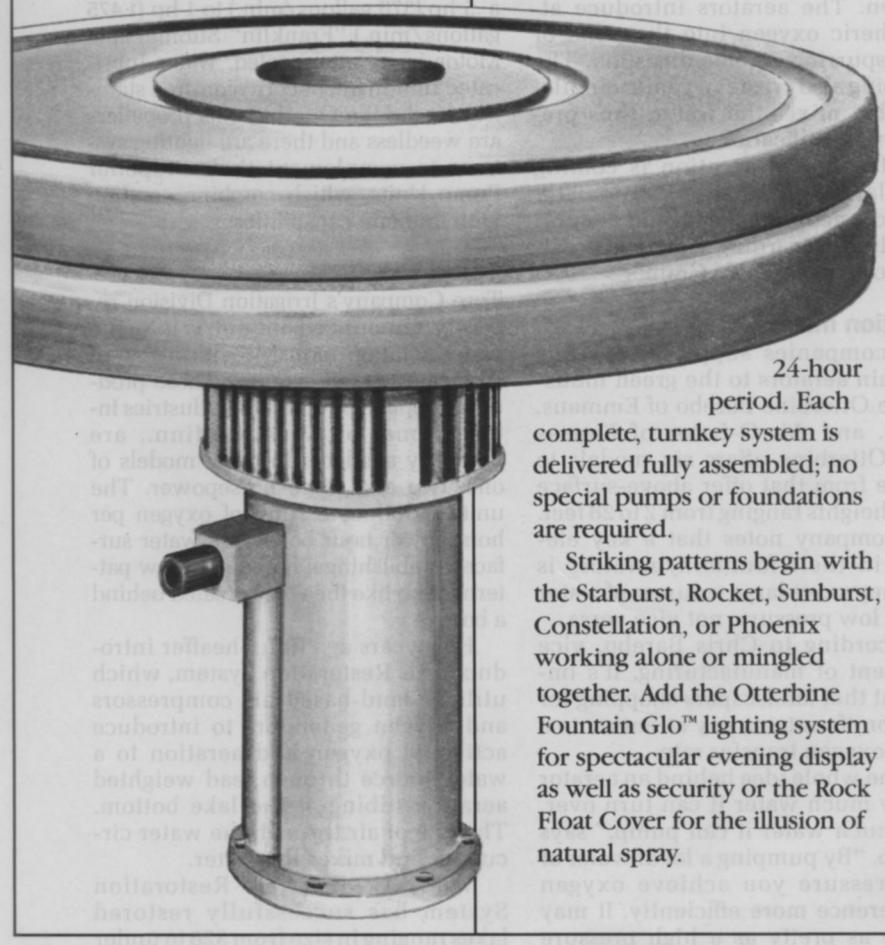
Heavy algal blooms can limit sunlight penetration, thereby restricting biological oxygen demand (BOD) in deeper water. It also limits water cir-

Troubled waters?

Otterbine Aerators

The prescription for troubled breathing, poor circulation, and changing temperatures in ponds and lakes is practical engineering that is esthetically pleasing.

These aerators range in power, circulating from 600,000 to 20 million gallons of water in a 24-hour period. Each complete, turnkey system is delivered fully assembled; no special pumps or foundations are required.



Striking patterns begin with the Starburst, Rocket, Sunburst, Constellation, or Phoenix working alone or mingled together. Add the Otterbine Fountain Glo™ lighting system for spectacular evening display as well as security or the Rock Float Cover for the illusion of natural spray.

Otterbine Aerators meet the water management needs of golf courses, parks, recreational lakes, office developments, and residential condominiums. Call or write for more information:

Barebo Inc.
R.D. 2, P.O. Box 217
Emmaus, PA 18049

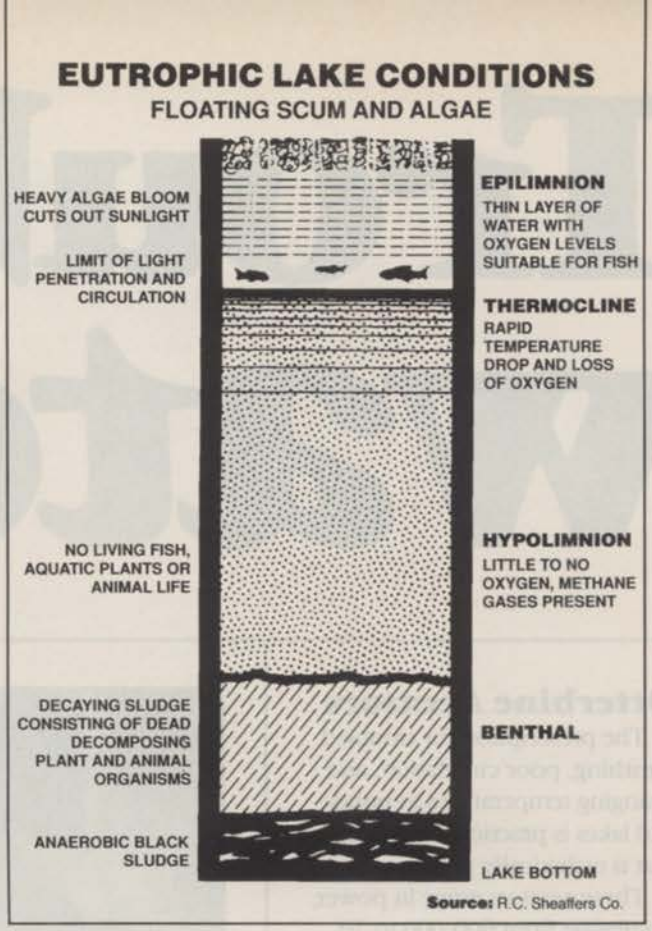
215/965-6018

OTTERBINE BAREBO, INC.

"See us at GCSAA show, Booth No. 3632-35."

Circle No. 103 on Reader Inquiry Card

By returning oxygen to water, fountain aerators combine aesthetic appeal and utility.


EUTROPHIC LAKE CONDITIONS
FLOATING SCUM AND ALGAE
HEAVY ALGAE BLOOM CUTS OUT SUNLIGHT
LIMIT OF LIGHT PENETRATION AND CIRCULATION
EPILIMNION
THIN LAYER OF WATER WITH OXYGEN LEVELS SUITABLE FOR FISH
THERMOCLINE
RAPID TEMPERATURE DROP AND LOSS OF OXYGEN
NO LIVING FISH, AQUATIC PLANTS OR ANIMAL LIFE
HYPOLIMNION
LITTLE TO NO OXYGEN, METHANE GASES PRESENT
DECAYING SLUDGE CONSISTING OF DEAD DECOMPOSING PLANT AND ANIMAL ORGANISMS
BENTHAL
ANAEROBIC BLACK SLUDGE
LAKE BOTTOM
Source: R.C. Sheaffers Co.

culation and can remove large amounts of oxygen before it dies off.

The catch-22 in this situation is that the most efficient way for a pond or lake to decompose dead algae is via aerobic digestion. Aerobic digestion occurs when wastes are biodegraded by aerobic bacteria. However, for aerobic bacteria to function, it needs— you guessed it—oxygen. So while aerobic digestion is fast, efficient and odorless, its effect is limited in an oxygen-depleted water source.

Smell that smell

The other option is anaerobic digestion, a slow, inefficient process that exudes the "rotten egg" odor of its byproduct, hydrogen sulfide.

Traditionally, algae has been kept in check with chemical controls, specifically absorbefacients and algaecides. However, some effective chemicals, such as copper sulfide, can harm ornamentals. Also, a waiting period of several days is recommended before treated water should be tapped for irrigation.

Add to these considerations today's heightened awareness of judicious chemical use and it becomes clear that an alternative or at least complementary method of controlling water quality is needed. It is a void being filled nicely by the fine array of mechanical aerators on the market today.

Many landscape managers incorporate a titration kit to determine oxygen content of a pond. If the water is suffocating, floating mechanical aerators can be used to add necessary oxygen. The aerators introduce atmospheric oxygen into the pond or lake, spurring aerobic digestion. The pumping also creates a gentle circulation that mixes the water, thus preventing stratification.

"Mechanical aeration is coming into play more and more, particularly due to oncoming local and federal guidelines regarding chemical treatment of ponds," adds Cramer.

Aeration manufacturers

Two companies supplying floating fountain aerators to the green industry are Otterbine Barebo of Emmaus, Penn., and Air-O-Lator of Kansas City. Otterbine offers six models to choose from that offer above-surface spray heights ranging from 2 to 28 feet. The company notes that a key element in their fountain/aerators is that they move large volumes of water under low pressure, not vice versa.

According to Chris Barebo, vice president of manufacturing, it's important that landscapers shopping for aeration/fountains pay attention to a unit's oxygen transfer rate.

"The whole idea behind an aerator is how much water it can turn over, how much water it can pump," says Barebo. "By pumping a lot of water at low pressure you achieve oxygen transference more efficiently. It may not be as pretty as a high pressure fountain, but you're going to do a lot more for the water."

Air-O-Lator's floating surface aerators, the AF-55 and SC-51D, feature a .5 hp (370 gallons/min.) to 1 hp (1,475 gallons/min.) "Franklin" Submersible Motor in a water-cooled, water lubricated unit made of corrosion-free stainless steel. Like Otterbine, its propellers are weedless and there are lighting systems to complement their Propeller Pump Units, which combine aeration with fountain capabilities.

Below the surface

Toro Company's Irrigation Division recently announced its entry into the water aeration industry with a line of surface-mounted aerators. These products, supplied by Aeration Industries International of Chaska, Minn., are currently available in three models of one, two and three horsepower. The units introduce 2.5 lbs. of oxygen per horsepower hour below the water surface, establishing a horizontal flow pattern much like the wake created behind a boat.

Five years ago Ron Sheaffer introduced his Restoration System, which utilizes land-based air compressors and oxygen generators to introduce activated oxygen and aeration to a water source through lead weighted aeration tubing at the lake bottom. The rise of air through the water circulates and mixes the water.

The R.C. Sheaffers Restoration System has successfully restored lakes ranging in size from 326 to under One-half surface acres with depths of over 35 to under three feet. **LM**

New 8x8 torque converter transmission gives you the speeds you need

With eight forward and eight reverse speeds, Ford C-Series tractor loaders don't miss a thing! You get exactly the speed you want for loading, grading, tilling, mowing, raking, seedbed preparation and roading.

The new eight-by-eight fully-synchronized, power-reversing torque converter transmission creates its own world. It's coupled with a 540-rpm independent PTO to make more efficient use of power for a wider range of work.

More speed selection

For rototilling you get a ground speed under 1.5 mph. Three speeds between three and six mph for grading, loading and mowing. And a top speed near 20 mph gets you down the road fast.

Smooth direction changes

For fast, efficient loading and grading, a smooth electric forward-to-reverse powershuttle allows you to change directions without clutching or stopping. If you want to hold a constant ground speed, just engage the electro-hydraulic torque converter lockup. It forms a solidly-coupled driveline so constant ground speed is maintained for mowing, tilling or fine grading.

Want more versatility? You can turn your tractor into a backhoe loader in a matter of minutes with the Model 764 backhoe attachment. It has a digging depth of ten feet, eight inches, and more than five tons of bucket digging force.

Often, buying the right tractor loader comes down to choosing the right features. Your Ford New Holland dealer has more to offer. He's listed in the Yellow Pages under "Contractor's Equipment & Supplies."

Find out how good a Ford C-Series tractor loader can be.

Ford
FORD
NEW HOLLAND

Circle No. 109 on Reader Inquiry Card

For best results, thoroughly irrigate prior to treatment. Follow your application by watering in to a depth of 1 to 1½ inches.

DYLOX and OFTANOL are Reg. TMs of Bayer AG, Germany ©1989 Mobay Corporation

When you have grub control this effective, you have grounds to celebrate.

DYLOX controls armyworms, bagworms, and stink bugs on your trees, shrubs, and flowers as well as controlling cutworms and sod webworms on your turf.

OFTANOL also controls billbugs, cutworms, chinch bugs, Hyperodes weevil, and sod webworms.

To identify grub populations, look for patches of wilted, dead or dying turf. Grub-infested turf has pruned roots which make it easy to pull back like carpet.

Some of the most celebrated courses in the country turn to Mobay products for *grub protection*.

For preventative treatment, there's OFTANOL® Insecticide. It controls *grubs* longer than any other product available. Apply it in the spring before *grubs* show up. After all, spring rains and temperatures can mask a *grub* problem.

Or apply a pre-damage application of OFTANOL when *grub eggs* hatch and activity begins (usually right after a drought-breaking rain in the early fall). But only apply OFTANOL once a year. If you've already used it in the spring, treat with DYLOX® Insecticide.

Of course, if grub damage turns up, apply DYLOX followed by heavy watering. DYLOX controls *grubs* in as little as 24 to 48 hours.

For more information, contact your Mobay distributor or Mobay sales representative. They can help you make your turf look great. And that makes you look great. Which is cause enough to celebrate.

Mobay Corporation
A Bayer USA Inc. Company

Bayer

Specialty Products Group
Box 4913, Kansas City, MO 64120
816-242-2333

Dylox
Oftanol

Circle No. 117 on Reader Inquiry Card

WHEN THE RUBBER MEETS THE ROAD

Managing travel time is a never-ending problem for landscape managers. When does the clock start? How does travel time affect the total costs of the activity, the production, and people who are traveling?

by Philip D. Christian III

It is customary in our industry, as in others, for the workers to provide their own transportation to the job, and to travel on their own time. Once on the job, any additional travel required to perform their duties is paid for by the company.

Managing travel time in a business context then refers to the time required after we arrive at the workplace, or the time required for a mobile crew to move from one property to another.

When we travel, we are on the job but not actually working or performing a service.

The mobilization process requires extra time for loading and unloading and the purchase of special equipment on wheels to transport the equipment and people to the property site. We bring everything needed to render the service. All of this is part of the cost of the service.

The customer usually understands the cost of mobilizing our crews and equipment. It is the contractor who has problems rationalizing the costs of mobilization.

After all, riding in an air-conditioned crew cab truck listening to a Rolling Stones tape on the cassette player does not fit within our ethic of hard work. But getting the right people and equipment to the property in a timely manner is a valuable and expensive part of our service. In fact, the hours spent in travel time may be more expensive on a per-hour basis than the hours spent actually producing the work.

We tend to believe the costs do not begin until the real work begins. That is not true. What would it cost per customer if you loaded up three people, all the proper tools, drove 20 minutes to the property, unloaded everything, and got ready to work but did nothing? Spend a few minutes reviewing the property you did nothing to, a few minutes with the customer, load everything and everyone back up, and then stop the stopwatch. You will find you have spent a better portion of an hour just getting ready to do the "real work."

Pricing an hour

Let's look at the costs of that hour.

Properly loading and unloading the equipment is "real work" and requires everyone on the crew. It also requires some skill. (Remember the damage to the equipment when it is improperly handled.)

Transporting the equipment and crew to and from the properties requires the use of the most expensive equipment we own, the truck and trailer. When purchase price, maintenance, insurance and licenses of the truck and trailer are added, we find

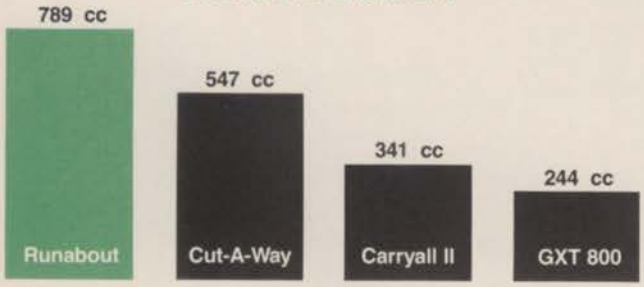
Travel to and from the work site may be more expensive on a per-hour basis than the hours spent actually producing the work, according to the author.

Why does the competition shrink from a side-by-side comparison to the Cushman® Runabout?

Why? Because the Cushman® Runabout gives you more payload and more power to do more jobs for more years. And at $5,220*, no other utility vehicle can match its blend of value and performance.

It's that simple.

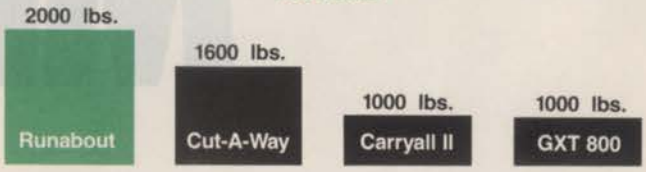
ENGINE DISPLACEMENT



The proven, Cushman 222 overhead valve engine provides greater displacement for more torque and horsepower in the critical RPM range required for turf applications. A beefier, boxed-channel frame of carbon steel accommodates heavier implements and a one-ton payload.

The heavy-duty Runabout is more maneuverable. More durable. And it's backed by the industry's finest network of dealer service.

PAYLOAD



When a light utility vehicle isn't enough, and a full-function Cushman® Turf-Truckster™ is more than you need, the Cushman Runabout stands head and shoulders above the rest. Contact your Cushman dealer for a convincing demonstration, or call toll-free 1-800-228-4444 for more information today.

The Carryall II® is the registered name of Club Car®. The Hijet® Cut-A-Way is a registered trademark of Daihatsu. The GXT 800 is a product of E-Z-Go®, a Division of Textron Inc.

*Does not include sales tax, freight, or dealer prep; suggested price listed in U.S. dollars. Prices may vary with dealer and region.

CUSHMAN®

BUILT TO LAST

8073 Cushman, P.O. Box 82409, Lincoln, NE 68501

Cushman, Inc. 1989. All rights reserved.

Circle No. 106 on Reader Inquiry Card

they are by far the most expensive pieces of equipment we own based on annual cost. During transit, they are consuming more gas, using more tires, and wearing out more parts than any other piece of landscape maintenance equipment we own. The equipment being hauled by truck and trailer is also subject to travel wear.

In some cases, transport wear can be more expensive than the wear-and-tear on the small gasoline engines when they are in use.

Estimating time

The cost of travel time confuses the estimating process unless it is isolated so the estimator can judge the real impact on the project. The larger the job, of course, the less it is affected by travel time. You may be very competitive out of your immediate geographic area if you do not allow travel time to artificially inflate the cost.

We recommend that you estimate the cost of maintaining a property as though it were next door to, or within 15 minutes of your shop. Then add as a separate item travel time.

The estimator can calculate the number of trips required to complete the landscape services, then project the number of people on the crew, and he or she will know exactly how long it will take to transport the people and equipment from the shop to the property or from one property to the next.

```
# visits to site
X # people per visit
X hours to and from per visit
X average man-hour wages
-----------------------------
= $ PER YEAR FOR TRAVEL
```

Most successful contractors use the same hourly price for travel (see equation) as they do for performing the "real work" on the property.

Production effects

Production cannot be fairly judged or calculated unless one knows the average travel time and subtracts it from total man-hours spent in actual production.

In your man-hour tracking system, we recommend that you separate travel time on the time sheet so you have a sum total for travel time at year-end, to be compared to estimated travel time. Many production problems can be tracked to gradually increased travel time due to traffic, changes in routes and unnecessary stops during travel.

Some contractors in our industry believe they don't pay for travel because they deduct the estimated time required to travel from the on-clock time. They call that "production time" or "pay time."

The contractor explains to the crew that no one is paid for travel time except the crew chief or driver. The crew members have the option of providing their own transportation to and from the properties. If they prefer not to do that, the company will supply safe and comfortable transportation for them at no cost.

The first option is actually no option at all because it requires crew members to provide their own transportation, but they are still not paid travel time.

For example, the production manager has established an average pay of $6.50 per hour for crew members. He or she defends this hourly wage by saying that is what it takes to get good people. Experience has shown that even $5.50 an hour would not attract good people in their particular market. The production manager goes on to explain that there is keen competition for the few good people available in the market, and good help is hard to find.

MITE.

In this example, the typical crew spends 10 hours a day on the clock. Two hours is deducted for travel time. Actual pay is for eight hours a day or $52.00 per day.

(If this "no pay for no travel" theory was applied to the lawn care industry, the average lawn specialist would only make $16.50 per day. They spend 2.54 hours in actual production and 5.54 hours traveling two and from their stops.)

Dividing pay

I wonder if the production manager who is completely convinced that he or she must pay $6.50 an hour to get acceptable workers knows that the workers divide their average income of $52.00 a day by 10 hours, which equals an average income of $5.20 an hour?

You see, everyone pays for travel time. Deducting that two hours for travel does not change the fact that workers are on the job for 10 hours per day. They were not on vacation doing what they would do on their own time.

The result of your "no pay for travel" thinking is that you have lowered the average income per hour from $6.50 to $5.20. By doing this, you have inherited all the problems associated with paying below the competitive hourly rate and will surely experience low production, absenteeism and high turnover.

But that is not the limit to the downside of "no pay for no travel" thinking. Crew members are theoretically on their own time during travel; they may persuade the driver to stop between properties at the fast food locations and there is no incentive to make this a quick stop. In fact, if the stops could be prolonged, adding up to more than two hours, then the workers are actually being paid $5.20 an hour for hanging out at the 7-11 store.

Rewarding sloth

Another theory: if you are only paid for the actual time worked, the slower you work, the more you are paid (i.e., if you work slower, the crew makes fewer stops per day, therefore less time is deducted for travel).

Workers do not usually think in such negative terms. But there is no incentive for increasing productivity when we don't pay our people for travel.

The "no pay for travel" thinking lures us into the large crew mentality. When production managers believe that travel is free, they are often tempted to send large crews to "knock it out" when smaller crews would be much more efficient. Stay tuned for the large crew/small crew theory next month. **LM**

Philip D. Christian III is a business consultant with All-Green Management Associates based in Alpharetta, Ga.

NEW LIQUID FORMULATION!

MIGHTIER.

In the battle for healthy ornamentals, only the strong emerge victorious. And the weak fall by the wayside.

Introducing new flowable MORESTAN® 4 Ornamental Miticide.

With MORESTAN, you get the strength you need to defeat even the worst mite infestations, the type of infestation that can devastate an entire ornamental crop. Superior performance in a water-based liquid formulation, free of solvents that can cause phytotoxicity. With proven knock-down power, strong ovicidal activity and excellent residual control.

MORESTAN. For the power to control the mightiest of mite problems.

Mobay Corporation
A Bayer USA INC. COMPANY

Bayer MOBAY

Specialty Products Group
Box 4913, Kansas City, MO 64120

Morestan is a Reg. TM of Bayer AG, Germany. ©1989 Mobay Corp. 67431

Circle No. 119 on Reader Inquiry Card

AERATION WORKS!

If turf could talk, you'd hear all about the benefits of soil aeration. It's a service worth selling.

by Terry McIver, associate editor

Aeration, a standard procedure on the golf course, helps to improve the turf's overall stress resistance.

Soil aeration is the turf manager's favorite remedy for the problems of soil compaction, thatch build-up and interfacing soils.

When done correctly and on time, aeration assures that the soil will be better able to withstand a season of heavy traffic and harsh weather.

Thanks to aeration, the effectiveness of fertilizers and pesticides is improved, and overseeding into established lawns can be done without destroying existing grass. The gaseous exchange between the soil and atmosphere is clear, creating a favorable growing medium for seed and established turf.

To battle compaction, coring opens a channel between soil layers, removes part of the problem soil and permits topdressing and refilling with more compatible material.

In the fight against thatch, aeration improves the growing medium for new seed. Excessive thatch can lead to a poorly-rooted generation of new grass.

Aerate in spring or fall

Aeration in cool-season grasses is most effective when done in the spring and fall, to coincide with increased foliar growth. This minimizes the time the lawn is damaged by the process and reduces the probability of annual weed invasion.

Aerifying too late in the fall or too early in the spring leaves a lawn open to additional winter annual weed germination from knawel, speedwell, henbit and chickweed, and summer annual weeds like knotweed.

Aerifying too early in the fall or too late in the spring provides a seedbed for summer annual weeds such as lespedeza, prostrate spurge, purslane and crabgrass.

The opportunity for maximum effect from aeration generally occurs for cool-season grasses in April, May, September and October.

Reduce your water use

According to Bob Brophy, marketing manager of lawn care products for Cushman, proper aeration can reduce water requirements up to 25 percent without harming the grass plant.

"The cost of the aeration itself will be recouped over a year's time in water savings," says Brophy.

"Because you're getting the water down to the rootzone," Brophy ex-

On Some Lawns, Grubs Just Aren't a Problem.

OFTANOL is a Reg. TM of Bayer AG, Germany. 75351 © 1989 Mobay Corporation

OFTANOL™ controls grubs before they have a chance to do their damage. Providing continuous protection that lasts. Nothing works better. It's your best bet for grub control.

OFTANOL

Mobay Corporation
A Bayer USA Inc. Company

Bayer MOBAY

Specialty Products Group
Box 4913, Kansas City, MO 64120

Circle No. 122 on Reader Inquiry Card

The old standby drum roller, which aerates quickly and never needs fueling. Drums can be detached, depending on the size of the area in question.

plains, "you're not letting it evaporate or get lost in the thatch layer."

Brophy also reminds landscapers that by opening the ground with aeration, fertilizers and other control products will reach their targets more effectively.

Cushman's Bob Brophy: aeration can show a 25 percent water savings.

"That's why a lot of lawn care companies try to sell aeration with the first fertilizer application," says Brophy. Customers are then told to water after the aeration service to wash the fertilizer down into the rootzone.

It's not a hassle

Landscapers whose customers view aeration as a hassle because of the remaining core material have to explain the benefits better.

"The aeration cores stimulate microbial activity to break down the thatch," says Brophy, "and make a better growing medium."

Experts also say it's important to coordinate aeration with overseeding: aerate first, then overseed. That way the cores can be broken up with the overseeder. This will also eliminate the problem of grass growing in clumps inside aeration holes.

Sell the benefits

John Haubrich, general manager of Thornton Landscape in Maineville, Ohio, stresses to customers aeration's positive effect on thatch, especially during dry spells. "During the drought two years ago," says Haubrich, "we strongly recommended it, there was so much compaction."

Haubrich says the company aerates about 100 acres each year, for about 60 percent of its clients. The service is presented as part of a maintenance package.

"If it's a new account," says Haubrich, "we go in proposing everything. Hopefully, they'll buy everything, but not every client will. If there are budget constraints, aeration is one of the first things that'll go. The client may need to thrift out, and maybe will agree to it next year."

Steve Ashton, manager of the Tree Division for Molar, Inc., says company crewmen recommend aeration to customers if they see a need for it during the course of a visit. The service is sold at a minimum of $35, and Ashton says it has been well received. "It's an old neighborhood, and lawns are so compacted," explains Ashton. "It's never a hassle for us. It's a rainy-day job in spring and fall."

Aeration can be sold as an end-of-the-year "extra" when customers have a few dollars left in their yard budgets.

Finding the money

Charging $10 to $12 per 1000 square feet is reasonable, according to Ed Gallagher, landscape maintenance manager for Yardmaster of Painesville, Ohio. For harder-to-reach areas, such as throughout condominium areas, Gallagher suggests charging $12 to $15 per thousand.

"We try to put the service in as a way to complement the fertilizer application," says Gallagher. "If the customer is going to put dollars into fertilizer, aerification is certainly the most complementary service.

"You can fertilize and fertilize and fertilize," Gallagher explains, "but if you don't do some of the mechanical treatments, like aeration, you'll develop extreme thatch problems on top of compacted soil. Then you run into disease and stress problems."

The money for aeration is there; it's the landscaper's challenge to find it.

"Companies are going to sell a lot of 'extras' throughout the year," says Gallagher, such as annuals or other plant material. "Aerification, if sold properly, can be another one of those extras, when it comes down to September and October, and they still have a few bucks in the budget." **LM**

Beaver Creek Resort, Colorado

Get all the yellow nutsedge and none of the innocent bystanders.

Now you can really control yellow nutsedge from sod and ornamental grass* — without damaging the grass.

It's simple. Just put down BASAGRAN® herbicide from BASF. No need for you to be selective. BASAGRAN does that for you.

It's safe to grass and easy to use. And as effective against yellow nutsedge as anything you can buy.

Always follow label directions.

*Do not use on golf course greens.

BASF Corporation
Chemicals Division

BASF

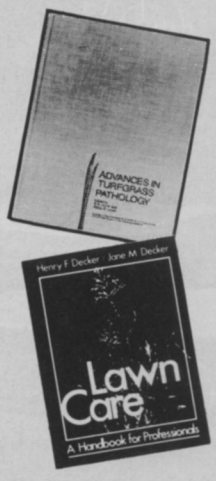
BASAGRAN is a registered trademark of BASF AG.
© 1988 BASF Corporation.

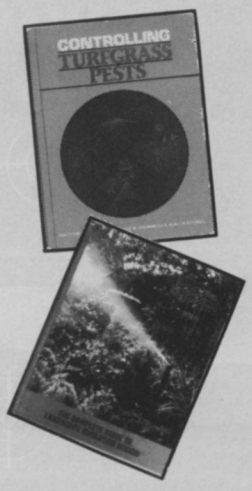
BOOKSTORE

010 - ADVANCES IN TURFGRASS PATHOLOGY
by Joyner and Larsen
Leading U.S. turf pathologists report on turfgrass diseases, pythium blight, snow molds, fairy rings, leaf spot of Kentucky bluegrass in Minnesota, initial and field fungicide screening, turfgrass disease resistance, etc. Contains new ideas on how to combat turfgrass problems. **$27.95**

220 - CONTROLLING TURFGRASS PESTS
by Shurtleff, Fermanian, Randell
New comprehensive guide provides the most up-to-date information available on the identification, biology, control and management of every type of turfgrass pest. **$46.00**

230 - LAWNS-Third Edition
by Dr. Jonas Vengris and Dr. William A. Torello
Designed as a textbook or a practical usage manual, this book has been completely brought up-to-date. Care of lawns and turfgrass, from selection of varieties to maintenance of established grass is completely covered. **$27.95**





235 - LAWN CARE: A HANDBOOK FOR PROFESSIONALS
by H. Decker, J. Decker
Written by turfgrass professionals, this handy guide will be invaluable for playing field managers, golf course managers, or any lawn care practitioner. Covers all aspects of turfgrass management. **$46.00**

640 - TURF IRRIGATION MANUAL
by James Watkins
A guidebook for engineers, architects, designers and contractors. Keeps pace with the latest developments in turf and landscape irrigation. Specific chapters devoted to rotary sprinkler design systems. Golf course design systems and expanded engineering and reference material. **$28.50**

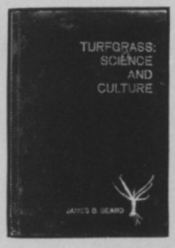
615 - TURF MANAGEMENT FOR GOLF COURSES
by James Beard
Written by an eminent turfgrass researcher, this USGA sponsored text is an ideal reference and "how to" guide. Details all phases of golf course design and construction, turf management, course administration, irrigation, equipment and disease and pest control. Fully illustrated. **$52.75**

620 - TURF MANAGEMENT HANDBOOK
by Howard Sprague
Practical guide to turf care under both healthy and poor turf conditions. Chapters cover turf in cooler and warmer regions, fertilizer use, regular turf care, weed and disease control and special turf problems. Useful seasonal schedules for management of turf areas. **$26.60**

225 - TURFGRASS MANAGEMENT
by A.J. Turgeon
Revised edition. Covers the latest developments in turfgrass science and technology. Heavily illustrated with dozens of new drawings. Provides specific recommendations for applying the newest pesticides, fertilizers and other materials to combat turfgrass problems. A valuable reference for diagnosing problems and determining their causes. **$52.00**

630 - TURFGRASS: SCIENCE AND CULTURE
by James Beard
Comprehensive basic text and reference source used in many leading university turf programs. Includes findings of current research compiled from more than 12,000 sources. **$52.00**

110 - TURF MANAGERS' HANDBOOK-Second Edition
by Daniel and Freeborg
ENTIRELY UPDATED. A practical guide for the turf practitioner. Chapters on grasses, growth regulators and diseases have had extensive modification. Innovations resulting from research and practice have been added to reflect the current techniques available for turf managers. **$32.95**



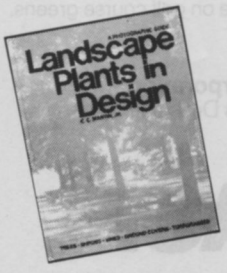
345 - COST DATA FOR LANDSCAPE CONSTRUCTION 1990
Kathleen W. Kerr, Editor
An updated unit cost data reference for designers and cost estimators. Developed to fill the tremendous need for detailed landscape construction cost data. Laid out in easy-to-use CSI format. Annual. **$39.95**

300 - LANDSCAPE DESIGN: A PRACTICAL APPROACH
by Leroy Hannebaum
Geared for the commercial designer/salesperson, this is a one-stop guide to the landscape design process. Covers the entire highly competitive field including design analysis techniques, pointers on land forms, specialized business landscaping methods, environmental design guidelines, specifications, estimations, bids. **$52.00**

320 - LANDSCAPE REJUVENATION
By Bonnie Lee Appleton
Explains how to rejuvenate a landscape renovation. Included is information on how to make an appraisal of the landscape, how to determine landscape needs, maintenance considerations, how to execute a landscape renovation. **$15.95**

375 - RESIDENTIAL LANDSCAPES
by Gregory M. Pierceall
An excellent reference for individuals involved in the design and development of plantings and constructed features for residential sites. Illustrations and actual residential case study examples are used to communicate graphic, planning and design concepts which are the focus of this text. **$53.00**

370 - LANDSCAPE OPERATIONS: MANAGEMENT, METHODS & MATERIALS
by Leroy Hannebaum
An in-depth examination that combines technical training in landscape science with methods of accounting, business management, marketing and sales. Discusses effective methods for performing lawn installations, landscape planting and maintenance. Step-by-step accounting calculations are explained in simple terms. **$52.00**



365 - LANDSCAPE PLANTS IN DESIGN
by Edward C. Martin
An annotated black & white photographic guide to the design qualities of ornamental plants and their aesthetic and functional use in landscape designing. Over 600 trees, shrubs, vines, ground covers and turfgrasses are described in non-technical language. Over 1900 photographs. Provides a basis for selecting the best plant materials for any particular use in landscape design. Contains detailed indexes that provide quick reference to particular design qualities and growing conditions. **$68.95**

305 - LANDSCAPE MANAGEMENT
by James R. Feucht and Jack D. Butler
Planting and Maintenance of Trees, Shrubs, and Turfgrasses. Describes the basic principles of cultural management of installed landscapes. The important factors of plant growth, soils and fertilizers, improved planting techniques and new pruning techniques, integrated pest and disease management, and spray-equipment calibration and care are all featured. **$35.95**

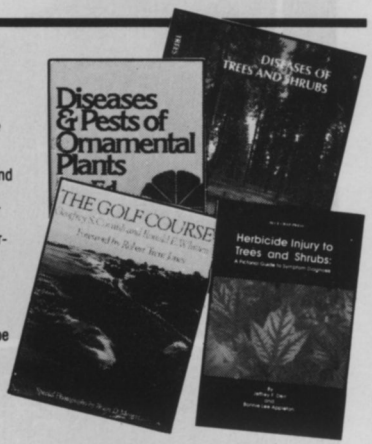
BOOKSTORE

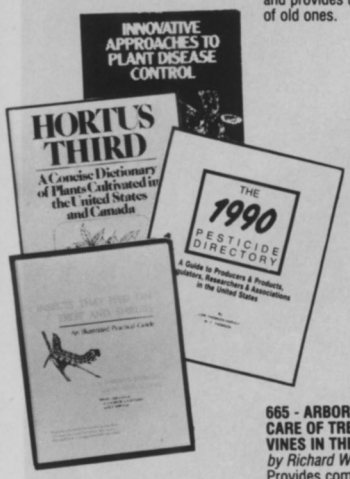
410 - DISEASES & PESTS OF ORNAMENTAL PLANTS
by Pascal Pirone
This standard reference discusses diagnosis and treatment of diseases and organisms affecting nearly 500 varieties of ornamental plants grown outdoors, under glass or in the home. Easy to understand explanations of when and how to use the most effective fungicides, insecticides and other control methods. **$39.95**

430 - DISEASES OF TREES AND SHRUBS
By Wayne Sinclain, Howard Lyon and Warren Johnson
A comprehensive pictorial survey of the diseases of, as well as the environmental damage to, forest and shade trees and woody ornamental plants in the United States and Canada. Reflects the most important developments in fungal biology and taxonomy, plant bacteriology, virology, and environmentally induced stress in plants. Summarizes information about newly discovered diseases and provides up-do-date accounts of old ones. **$49.95**

800 - THE GOLF COURSE
by Cornish and Whitten
The first book ever to give the art of golf course design its due, and golf course architects the credit and recognition they deserve. 320 pages and 150 color and black and white photographs. Traces the history and evolution of the golf course, analyzes the great courses, shows how they were designed and constructed. **$35.00**

420 - HERBICIDE INJURY TO TREES AND SHRUBS
By Jeffrey F. Derr and Bonnie Lee Appleton
Describes how to diagnose herbicide damage to nursery crops and landscape ornamentals. Injury symptoms resulting from the herbicides used today are described and compared to other plant disorders to assist in diagnosing plant problems. Tables list common names, trade names, major uses and injury symptoms for the herbicides currently used in agronomic, horticultural, landscape and noncrop areas. **$15.95**




INNOVATIVE APPROACHES TO PLANT DISEASE CONTROL
HORTUS THIRD
A Concise Dictionary of Plants Cultivated in the United States and Canada
THE 1990 PESTICIDE DIRECTORY
A Guide to Producers & Products, Regulators, Researchers & Associations in the United States

510 - HORTUS THIRD
from Cornell University
A 1,300 page concise dictionary of plants cultivated in the United States and Canada. A reference which every horticulture professional should have.
$135.00

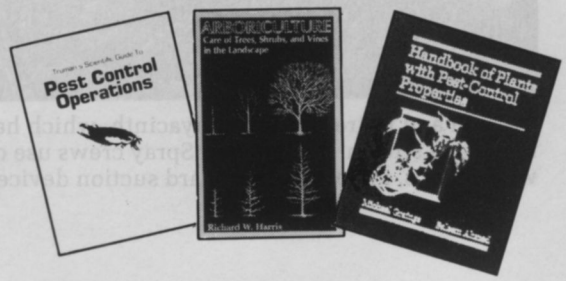
415 - INNOVATIVE APPROACHES TO PLANT DISEASE CONTROL
by Ilan Chet
Brings together alternative approaches and methods that have potential to control diseases caused by fungi, bacteria and viruses. Major concepts of disease control discussed include biological control systems, their possible mechanisms, potential application and genetic improvement. **$54.95**

690 - INSECTS THAT FEED ON TREES AND SHRUBS
by Johnson and Lyon
Essential information for identifying more than 650 insect pests and the injuries they cause. More than 200 color illustrations. **$49.95**

500 - THE 1990 PESTICIDE DIRECTORY
by Lori Thomson Harvey and W.T. Thomson
A Guide to Producers and Products, Regulators, Researchers and Associations in the United States. For the person who needs to know anything in the United States pesticide industry. **$75.00**
Available in March 1990

665 - ARBORICULTURE: THE CARE OF TREES, SHRUBS AND VINES IN THE LANDSCAPE
by Richard W. Harris
Provides comprehensive coverage of complete planting, site analysis, preparation and special planting methods, fully detailed coverage of fertilization, irrigation and pruning guidelines on preventative maintenance, repair and chemical control, how-tos of diagnosing plant problems, practical data on non-infectious disorders, diseases, insects and related pests and pest management. **$60.00**

450 - HANDBOOK OF PLANTS WITH PEST-CONTROL PROPERTIES
By Michael Grange and Saleem Ahmed
Provides information on approximately 2,400 plant species having pest-control properties in addition to the plant's specific common and family names, coded information is provided on such plant characteristics as life cycle, classification, and the ecological conditions suited for growth. Also lists 1,000 plants that are potential candidates for screening pest-control activity due to their poisonous nature or their ability to control human and animal diseases. **$46.95**


Pest Control Operations
ARBORICULTURE
Care of Trees, Shrubs, and Vines in the Landscape
Richard W. Harris
Handbook of Plants with Pest-Control Properties

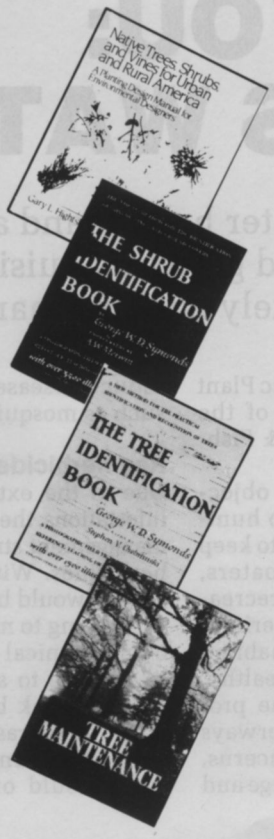
125 - SCIENTIFIC GUIDE TO PEST CONTROL OPERATIONS
by G.W. Bennett, J.M. Owens, R.M. Corrigan
Fourth Edition. New chapters on fumigation, urban wildlife, special facilities, plus updated, improved chapters on pesticides, cockroaches, birds, termites, equipment, sanitation, stored product pests and more. Don't be without this updated edition.
$49.95 Domestic All Others $60.00

400 - NATIVE TREES, SHRUBS, AND VINES FOR URBAN AND RURAL AMERICA
by Gary L. Hightshoe
This award-winning reference to native U.S. plants has now been expanded to include shrubs and vines. Over 250 major species are characterized by form, branching pattern, foliage, flower, fruits, habitat, soil, hardiness, susceptibility, urban tolerance and associate species. Includes unique color-coded keys that classify plant species by visual characteristics, cultural requirements and ecological relationships. **$86.00**

720 - SHRUB IDENTIFICATION
by George Symonds
Pictorial key to identify shrubs. Contains more than 3,500 illustrations to check specimens. Popular and botanical names are given for each shrub and handy index tabs for quick reference.
$12.95 paperback

750 - TREE IDENTIFICATION
by George Symonds
Pictorial reference to identifying trees by checking leaves, buds, branches, fruit and bark. Like its sister publication, SHRUB IDENTIFICATION, popular and botanical names are listed with index tabs for easy reference.
$14.95 paperback

760 - TREE MAINTENANCE
by Pascal Pirone
The sixth edition of this guide for anyone involved in the care and treatment of trees. Special sections on tree abnormalities, diagnosing tree troubles, non-parasitic injuries and assessing the suitability of different trees. **$45.00**


Native Trees, Shrubs and Vines for Urban and Rural America
THE SHRUB IDENTIFICATION BOOK
George W.D. Symonds
THE TREE IDENTIFICATION BOOK
George W.D. Symonds
TREE MAINTENANCE

Mail this coupon to: Book Sales, Edgell Communications
One East First Street, Duluth, MN 55802

Name _____

Street Address _____

City _____

State _____ Zip _____

Phone Number (____) _____

PAYMENT MUST ACCOMPANY ORDER

Signature _____ Date _____

Please send me the following books. I have enclosed payment* for the total amount.
Please charge to my Visa, MasterCard or American Express (circle one)

Account Number _____ Expiration Date _____

BOOK NUMBER AND TITLE	QUANTITY	PRICE	TOTAL PRICE

Domestic—*Please add $3.50 per order plus $1.00 per additional copy for postage and handling.

All others—*Please add $5.00 per order and if ordering multiple copies, also add $2.00 per additional copy to cover postage and handling.

Please allow 6-8 weeks for delivery.
Prices subject to change.
Quantity rates available on request.

_____ (postage & handling)

_____ Total Enclosed

Questions? Call 218-723-9471 or 9472

LM

Treated and untreated water hyacinth, which has completely covered this Louisiana stream. **Inset photo:** Spray crews use custom-made aluminum skiff boats outfitted with pumps, metering, overboard suction devices and outboard motors.

THE BAYOU: CLEARING ITS WATER

With more than 6.4 million acres of freshwater habitat and a sub-tropical environment that favors rapid aquatic weed growth, Louisiana is hard-pressed to keep water hyacinth from completely choking many waterways.

Water hyacinth is a major problem in the deep South, but in no state is this pesky aquatic nuisance more prevalent than Louisiana.

To meet this challenge, the state has an extensive and finely-tuned program. More than 50 workers are responsible for water hyacinth control, as well as other duties related to aquatic vegetation management, for an area of 48,523 square miles.

"We're spread pretty thin, but we've been able to fight water hyacinth down to a maintenance situation," says Richard Brassette, regional aquatic biologist for the Aquatic Plant Research & Control Section of the state Department of Wildlife & Fisheries in Baton Rouge.

The section's continuing objectives are: to maintain access to hunting, fishing and trapping areas; to keep state waterways open for boaters, skiers, sightseers and other recreational activities; to prevent deterioration or loss of wildlife and fish habitat; and to assist in maintaining healthy, balanced fish populations. The program also strives to keep waterways navigable for commercial concerns, and helps maintain flood drainage and reduce disease-transmitting vectors such as mosquitos.

Key herbicides

Due to the extent of water hyacinth infestations, the Aquatic Plant Section's management strategy relies heavily on herbicides. Without these materials, control would be impossible.

"Trying to manage water hyacinth by mechanical means in Louisiana is like trying to sweep back the ocean with a whisk broom—you just can't do it," says Brassette. "For instance, if using mechanical harvesters, our crews could only cover five or six

PROXOL®

When Surface Pests are at their worst PROXOL® works best.

Surface-feeding sod webworms, armyworms and cutworms don't stand a chance when PROXOL® 80SP is on the job. It's as easy to apply as a spray and has no unpleasant odor. Fast-working PROXOL readily penetrates thatch to control grubs. Yet it has no long-term residual build-up in the soil.

For a complete information kit on nourishing and protecting your turf, including a comprehensive guide on turf insect control, join the NOR-AM Turf Management Program. Write to the Communications Department NOR-AM Chemical Company.

NOR-AM®
NOR-AM CHEMICAL COMPANY
A Schering Berlin Company
3509 Silverside Road, P.O. Box 7495, Wilmington, DE 19803

Copyright © 1989 NOR-AM Chemical Company.
All rights reserved.

IMPORTANT: Please remember always to read and follow carefully all label directions when applying any chemical.

Circle No. 126 on Reader Inquiry Card

The water hyacinth challenge

Native to South America, water hyacinth was introduced into the U.S. in 1884 by Japanese representatives attending the International Cotton Exposition in New Orleans. By the turn of the century, the plant had become a major pest in Louisiana.

Water hyacinths can double their number every 10 days, and 10 plants can cover one acre in 10 months. A single plant has the capability of producing 65,000 to 70,000 daughter plants during the eight-month growing season in northern Louisiana. Because growing conditions are more optimum, this figure may double in the southern part of the state.

One acre of hyacinths can yield up to 45 million seeds every year, and these seeds can remain viable for 20 to 40 years. As many as 900,000 plants can raft together on one acre of water.

This pest completely blocks many Louisiana bayous and streams, making navigation impossible. Large-scale hyacinth infestations are also highly detrimental to fish and wildlife.

Spawning grounds of largemouth bass and other gamefish can be completely smothered and destroyed. Floating mats of hyacinth block out light and destroy other aquatic plants used as food by ducks, geese and other wildlife. Hyacinth is useless as a food source for waterfowl, and many good hunting lakes and ponds have been ruined by it. □

acres a day."

Brassette also stresses that mechanical control methods often can't be used at all. Stumps, trees and other underwater obstacles prevent mechanical removal equipment from operating and cause severe damage to machinery.

Herbicides, on the other hand, allow treatment of up to 25 acres of infested waterway per day by each of the 21 two-person spray crews. The two main herbicides used are 2,4-D and Rodeo.

"Due to large acreages of agricultural crops, particularly cotton, in northern Louisiana we cannot apply 2,4-D without special permission from March 15 to September 15," Brassette explains. "Rodeo is perfect for use in sensitive areas where there are agricultural crops."

There are no restrictions on use of water treated with Rodeo for irrigation, recreational or domestic purposes. However, Rodeo cannot be applied within one-half mile of a drinking water source point.

Herbicides allow treatment of up to 25 acres of infested waterway per day by each of the 21 two-person spray crews.

The biologist adds that Rodeo is also often used near residential areas where there is concern about off-site damage to lawns, shrubs or gardens. The active ingredient in Rodeo, glyphosate, is the same material used in Roundup herbicide, a product commonly used by homeowners to control weeds and grasses in lawns and flower beds.

Because of these special properties, Rodeo is also frequently used to control unwanted vegetation in Federal game reserves. In many cases, it is the herbicide of choice here.

"Part of our job is to provide the public with information on aquatic weed control," says Brassette. "We often recommend Rodeo for use in farm ponds and in subdivisions where lakes and ponds are part of the landscaping scheme."

Trained support

Each spray crew is made up of two to five workers operating from a boat that is specially-equipped for herbicide application over water. Most of the spray crews—and all of the supervisors working with them—have been thoroughly trained and are certified to apply herbicides correctly and safely.

This training and certification process is conducted by the Louisiana Department of Agriculture. State workers involved in commercial herbicide application attend a special school to obtain their certifications. They are re-certified every three years.

"We take this certification process very seriously," says Brassette. "Over 90 percent of our people are certified, and we're working on getting the others to complete the course."

The spray crews work primarily from custom-made aluminum skiff boats outfitted with pumps, metering and overboard suction devices and powered by outboard motors. Some crews use special 22-foot mud boats that are powered by V-8 inboard engines.

"We use these mud boats near spillways and other conditions where an outboard would have trouble operating," Brassette explains. "It's amazing where these boats can go in just a few inches of water."

During the mid-1970s, water hyacinth infestations approached an estimated 1.7 million acres in Louisiana. Since then, Brassette says that populations have fluctuated. Each year, the Aquatic Plant Section provides control of roughly 25,000 to 60,000 acres of water hyacinth. At this treatment rate, Louisiana is literally staying just one step ahead of the problem.

According to Brassette, growing conditions during the past few years have favored the spread of water hyacinth and complicated control efforts. More seeds germinate when conditions are dry, and Louisiana experienced several droughts in the late 1980s.

Another complicating factor has been heavy summer rains that raise water levels in rivers, bayous, lakes and other waterways. When water rises, hyacinth plants are carried further inland from shores and banks and quickly become established in new areas.

"If current control operations are reduced or interrupted, water hyacinth infestations would rapidly reach the levels experienced in the 1970s," Brassette warns. "The expenditures required to again reclaim public waterways would be economically staggering to the state." **LM**

WE'D LIKE TO TELL YOU ABOUT THE BIRDS AND THE BEES.

We'd also like to tell you about pets and other animals, and hundreds of species of ornamental plants.

Because they are the biggest reasons to use Mavrik Aquaflow.®

Mavrik® is water-based, effective at very low rates, and gentle on beneficial species. It is a non-restricted product and can even be sent through the mail!

Mavrik won't harm plants either, not even when sprayed on open blooms.

Yet Mavrik has excellent broad spectrum efficacy against most insect pests as well as mites.

So switch to Mavrik. Then if your customers are concerned about the materials you use, you can tell them about the birds and the bees too.

SANDOZ
CROP PROTECTION
CORPORATION
DES PLAINES, IL 60018

Use pesticides effectively. Read and follow label directions carefully.

© 1989 Sandoz Crop Protection Corporation
Mavrik and Mavrik Aquaflow are registered trademarks of Sandoz, Ltd.

Circle No. 130 on Reader Inquiry Card

Intensive maintenance of college campuses will become increasingly important as schools vie for their share of the shrinking student population.

TOWARD 2000

FUTUREVISION

The 1990s will bring more judicious use of chemicals, a more aesthetic landscape and closer involvement between management and labor, according to a panel of respected green industry executives.

by Jerry Roche, executive editor

Society will play an increasing role in the ability—or inability—of landscape managers to perform their job functions in the 1990s, according to a panel of industry experts.

At last year's Green Team Conference in St. Louis, three noted landscape managers—Jeff Bourne of Montgomery County, Md., John Michalko of Case Western Reserve University in Cleveland and Thomas Smith of Spring Grove Cemetery in Cincinnati—agreed that things will not get any easier for fellow practitioners in this decade.

Here are some problems cited by the experts:

- *Fewer students seeking a college education*
- *Loss of government's "sovereign immunity"*
- *What Bourne calls "life-cycle responsiblity"*
- *Loss of certain pesticides in the landscape*

College woes

"According to one study, the number of 18-year-olds nationwide will fall by 360,000 to about 2.4 million in the next five years," says Michalko. "About 19,000 seniors will be lost in Ohio alone in that period. Which means that budgets will be very, very tight" among collegiate building and grounds supervisors.

"Two things are at play in terms of colleges," adds Bourne. "The other is that fewer educated people will be coming out of colleges—certainly in our business—to provide that educated entry-level employee."

Michalko says that total enrollment will continue to drop, and that competition for the prospective student will increase.

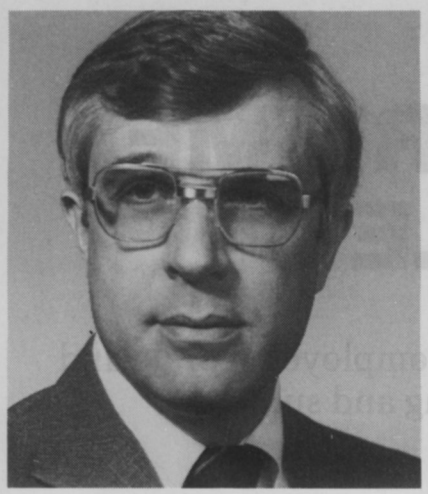
In another poll, fully one-half of the students queried ranked a visit to the campus as the most important factor in their choice of colleges, Michalko points out. Sixty-two percent name appearance as "an influence."

"We have to keep our appearance of the campuses up, no matter what," Michalko contends. "If you have the facility, that'll help your enrollment stay up, which in turn will keep your budget up."

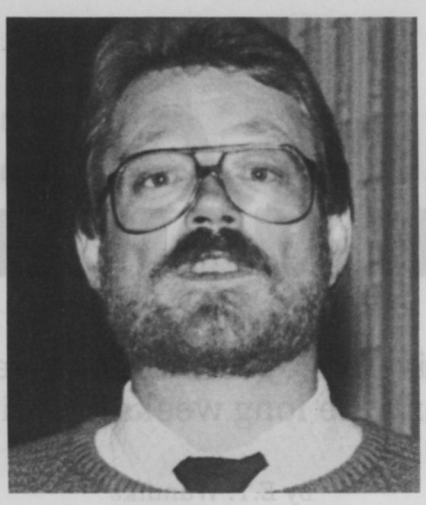
Sovereignty gone

"Risk management" and "cost containment" are the two biggest buzz phrases in the public sector, Bourne says.

In the past, governmental agencies could rest behind the protection of



Thomas Smith: Training and communication are buzzwords.



Jeffery Bourne: Fewer educated entry-level employees in the future.

John Michalko: The number of 18-year-olds in U.S. is declining.

sovereign immunity, which means that the government cannot be held financially liable in many cases. Losing much of their sovereignty means that governmental agencies are being forced more often to pay for accidents on their property.

"Risk management is a profession unto itself," notes Bourne. "The two primary (factors) are public negligence and public liability. It's a popular aspect of today's social climate that if you can win a suit against the government, you can retire and be independently wealthy for the rest of your life."

Not only will government landscapers be subject to these new risk management policies, but so also will private contractors doing business with the government, Bourne says.

"The boilerplate of contracts with government has suddenly become about an inch-and-a-half thicker," he notes from experience. "There are now an incredible amount of forms dealing with the risk of you doing business with the government. That's a part of your business as a contractor that you're going to have to live with. And it's simply going to continue to get worse."

Bourne notes that most public agencies are moving toward self-insurance. Each unit in his division, for instance, has to ante about $500 per year per vehicle into a "kitty," the funds of which are used to pay damages incurred in accidents. "So the cost of doing business with government and the cost of government doing business is escalating," Bourne concludes.

With stricter rules concerning the application of pesticides, landscape managers will be faced with further restrictions on their businesses, the panel contends.

"By 1995, every ounce of hazardous materials must be traceable through its entire life," Bourne notes. "And you are a part of that chain of responsibility."

This will mean an increase in paperwork and an edict that pesticide handlers be more than "spray-and-fly" jockeys. With these new regulations, Bourne says, "chemical maintenance will become more proper and more restrictive. It may well be relegated to time-consuming areas only."

Not only will government landscapers be subject to new risk management policies, but so also will private contractors doing business with the government, Bourne says.

Adds Smith: "We have to be taking a selective and responsible approach with chemicals. MSDS sheets are going to become increasingly important, along with right-to-know, chemical toxicity, LD_{50} values and IPM. We're going to be looking at the entire landscape ecosystem 10 years down the road, and not just try to control one particular problem at a time."

Futurevision

Smith also says that the mindset of the landscape manager will play an increasing role in the effectiveness of his or her organization.

"The companies that continue to look for new and better ways of doing things will be the ones that will spiral up," he notes.

"We've got to find new ways to keep the (landscape's) original essence. You can never quit thinking about automation. Anything that implies that the status quo is better than change gives the wrong impression. The good companies like IBM are always fixing things that aren't broken. They're finding better ways of doing things, cutting costs and improving quality—even when current performance is good, because they know it could be better. In Japan, any operation that will affect any other operation by $^{6}/_{10}$ths of one second is looked at."

Most of all, changing for the better implies making your employees better employees, Smith continues:

"'Training' and 'communication' are two buzzwords as we look into the future. Training should be a continual process; that's the way you're going to keep good people. You've got to learn to get things done through others while building them in the process, and then teach them to do the same thing.

"Certain things won't change as we move forward. People need respect, attention and love, and they always will. Give people the opportunity, and they'll feel their opinion is valued." **LM**

WORKING OVERTIME ON MORALE

By eliminating 'demotivators,' you can improve employee morale and production during the long weeks of spring and summer.

by E.T. Wandtke

The long, busy hours of spring are bound to put additional pressure on your employees. For them to remain motivated and maintain high morale, management needs to introduce incentives so their employees can work hard yet feel good about themselves and their work.

Management tends to overlook the need to introduce motivational incentives for employees, even though they're a simple, effective way to improve morale among workers who are working long hours under high pressure conditions.

An easy, effective first step is to allow employees to think for themselves. Let them make the field decisions that you usually made in the past.

While you're at it, get rid of the rules or management techniques that act as constraints to innovative or creative thinking by your employees. Employees are not robots, so don't treat them as if their sole purpose is to produce. Let them think while they work on a customer's property.

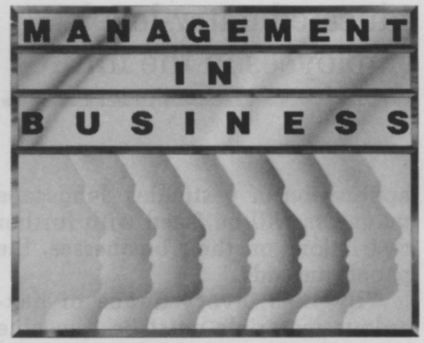
Many "demotivators" exist in green industry companies. Finding and getting rid of them will help improve employee morale this spring.

Exactly what are these "demotivators"?

Decisions that are singularly beneficial. Avoid making decisions that are for the benefit of only one employee or appear to benefit the owner of the company.

Often the urgency of problems in spring result in management making decisions that may be divisive to the company. For example, pressure to increase spring production may result in employees' only concern being to get the job done quickly—often with little regard to the quality of their work.

Stressing individual effort. Ours is a team business. Failure to promote team thinking generally results in your employees approaching their work with a one-on-one attitude. You lose the feeling that you're a part of



the company.

A lack of team attitude develops if and when you make decisions that seem inconsistent with the facts or previous decisions. Another sign is a sloppy, unkempt office area. This careless attitude about the appearance of the work area often carries over into the employees' attitude about customer service.

Spring is the time to change this approach to your workforce. Bring them together and re-establish the team concept. Have a pizza party or similar social event and let your employees know that you want them to work together as a team. Remind them that the uniform they wear is of your company and, as such, they are looked at by the community as a team.

Playing favorites. By singling out one or two individuals who seem to be carrying the company, you're creating a divisive environment. A few of your employees appear to be doing all of the work while other employees appear to be under-producing.

Eliminating these divisive actions will go a long way to improving the team attitude of your employees.

Manager passing of the buck. What happens when a supervisor voices his objections to your instructions in front of employees? Demotivation. Monitor managers to see if this condition exists. If it does, it must be corrected in order to remotivate your employees and rekindle in them a belief in the company.

Lack of employee communication. Spring often means employee turnover, and a lack of training of the new hires frequently exists. Having a workforce that is under-trained and not sure of its job frequently leads to employee frustration.

Meet with your employees during the early summer months and be certain they understand what you expect of them. This will go a long way toward relieving employees' anxiety.

Remote management. Another area of frustration and demotivation of employees is when a company is forced to deal with absentee owners. If you own a lawn care company but have not been actively involved with it, take the time to visit the company and introduce yourself to employees.

Individuals who work for absentee owners are often uncertain of their future opportunities and the direction of the company. Meeting the brains behind the operations will improve their job motivation.

Lack of employee recognition. If you do not have some method of recognizing outstanding employee performance, now is the time to do it. When an employee sees their name on a plaque, receives a day off, or gets a preferred parking place for a period of time, they'll strive for a higher level of performance.

Give your employees the opportunity to shine among their peers.

Owners who notice a declining attitude of their employees during the spring need to determine what demotivators exist within their company. With work demands high and the hours long, demotivators are out there lowering employee morale.

By reinforcing the team concept and paying attention to personnel's needs, you can remotivate and encourage your employees, while increasing your company's profitability. **LM**

It Works Better. It Costs Less. End Of Ad.

©1990 CIBA-GEIGY Corporation, Turf and Ornamental Products, Box 18300, Greensboro, NC 27419. Always read and follow label directions.

Circle No. 135 on Reader Inquiry Card

Fabric lends harmony to nutritional rivalry

Traditionally, trees and turf have been considered complementary of each other in the landscape. However, when placed side by side on certain areas of the golf course, an intense rivalry can develop between them for essential water and nutrients.

In effect, when trees are located too close to greens, tees, fairways or sand traps, they have the potential to cause tree root competition.

In these areas, trees have an excellent ability to absorb water and nutrients from the surface layers of the soil. This often robs the turf of these vital elements. In fact, a tree's feeder roots are located in the same soil as grass roots and the roots of ground covers and other plants.

All of this can be troubling for superintendents who want vigorous, deep-rooted, playable and aesthetically pleasing turf stands.

Putting surfaces are usually cut closer than collars or approach areas, and these areas are often more affected by competition from roots. If the turf shows stress due to tree roots, some relief can be obtained by raising the cutting height and implementing proper management techniques.

At times, however, it is necessary to prune tree roots to stop their unwanted invasion. Unfortunately, this practice is only temporary because tree roots can regrow quickly. A better solution to root problems is to use a root barrier after root pruning.

A new type of root barrier called Typar Biobarrier, marketed by DowElanco, offers several significant advantages over other barrier methods, especially long-term control.

Biobarrier is a multi-year root control system consisting of herbicide time-released nodules permanently attached to a permeable geotextile fabric. This fabric creates a vapor barrier that stops plant root encroachment into golf course greens, tees, fairways, sand traps, cart paths and other areas.

When installed vertically between the tree roots and the green, tee, fairway or paved surface to be protected, Biobarrier's control will be the most effective.

By pruning tree roots and installing Biobarrier, it is possible to reduce shock to the tree in the long run because repeated root pruning every few years can be eliminated.

Mike O'Connell, superintendent at the Maketewah Country Club in Cincinnati, Ohio, installed Biobarrier around some of his greens, fairways and roughs.

Subsurface competitors

In the past, his only method of control was to prune tree roots occasionally as needed. This proved time consuming and disrupted play too much in some areas, and the roots returned in just a few years.

The Biobarrier system provides long-term prevention of root encroachment.

"We think Biobarrier will control our root problem for many years," says O'Connell, "which will lead to improved moisture conditions in troublesome turf areas."

Before installation, tree roots grew unobstructed into turf areas. This meant that O'Connell had to use more water in some locations to compensate for the great amount of water taken by trees.

In fairways, for example, maple and oak tree roots were growing under the turf, causing dry areas and taking water and nutrients away from the turfgrass.

Short greens require more

At the Hole in the Wall Country Club in Naples, Fla., Buddy Carmouche installed 200 feet of Biobarrier next to a green that was competing with oak and ficus trees for water and nutrients. Because the turf can't always handle the combination of lower cutting height and tree root competition, the cutting height must often be raised in the summer just to maintain grass in some areas.

"We recently rebuilt a bunker that has ficus trees growing about 30 feet away," Carmouche says. "So when we dug the bunker out deeper, we used the opportunity to cut the tree roots on the greens side and on the bunker lip side and just pull the roots out. We then installed Biobarrier, curving it along the new lip. We already see some results from last summer's installation. If this continues, we will probably use it on all the greens next year."

Cutback in cutting

Root cutting was a ritual for Dale Caldwell, superintendent at Minneapolis Golf Club. He'd use a trencher or vibratory plow every four or five years to sever problem roots.

"We're using Biobarrier now in our roughs bordering our fairways," explains Caldwell, " plus along our greens, sandtraps and bunkers to keep the roots from encroaching those areas and sapping the nutrients and moisture from the turf."

And Caldwell reports dramatic change. "In the rough, the turf is dried out; the trees are taking a lot of their moisture. But beyond the trench where we put Biobarrier, the turf is green and looking healthy."

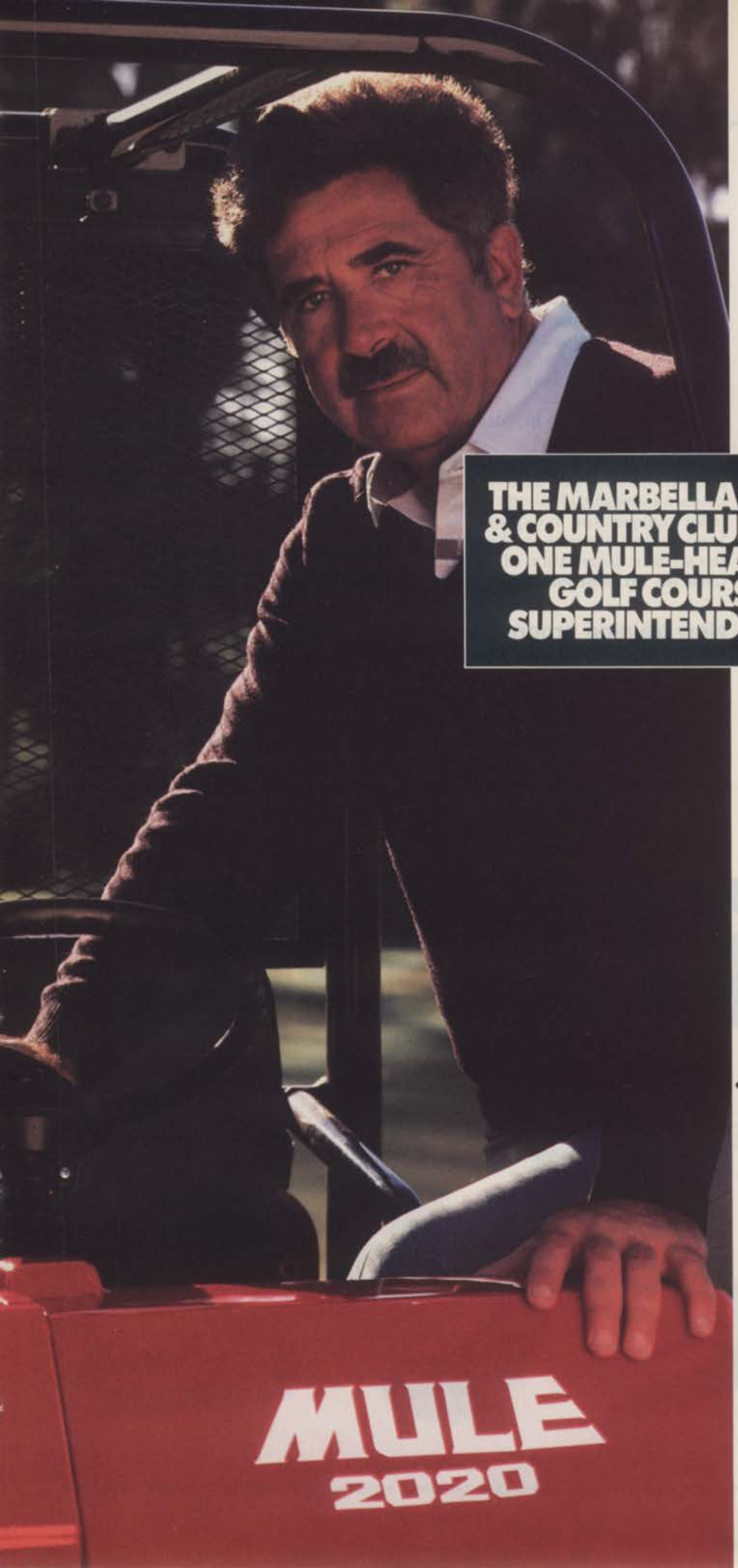
Saving cart paths

Cart paths can also fall prey to errant roots. What's more, structural damage can be compounded by a lawsuit if a golfer is injured due to faulty pavement.

Dick Naccarato of the Naples Beach Hotel and Golf Club in Naples, Fla., is attempting to solve his root problems on cart paths by installing Biobarrier along certain areas.

"Some people prune tree roots on a regular basis to help alleviate the problem temporarily," says Naccarato. "But I'd have to do this so often that I'm afraid I'd be taking away too much of the tree's support system. That's why I really haven't been able to do much about roots until now."

Naccarato bought several rolls of Biobarrier to install along cart paths next to troublesome trees. The course contains a total of four miles of cart paths, but only certain areas must be replaced regularly. Because the cart paths are asphalt, tree roots grow easily into them, creating cracks and bumps in a few years. Naccarato plans to install Biobarrier in those areas, in the hope that it will forestall as much as $5000 in cart path replacement costs. **LM**



THE MARBELLA GOLF & COUNTRY CLUB HAS ONE MULE-HEADED GOLF COURSE SUPERINTENDENT.

When it comes to maintaining the grounds of the $22 million Marbella Golf & Country Club, Corey Eastwood, CGSC, can be very stubborn.

For the past four decades Corey's life has been on the green. And in all that time he hasn't found anything that works as hard as the new Kawasaki Mule™ 2020.

The 2020 has many of the same features as our Mule 1000—which Corey also has. Like rugged suspension, powerful two-wheel drive and more than enough room for two big groundskeepers. But, the 2020 also comes standard with our newly designed smooth turf tires.

When it comes to muscle, the 2020 has plenty to flex. It not only can carry a payload of 1,330 pounds, but with the optional trailer hitch will haul an additional 1,100.

The Mule's flat bed design and construction makes it easier to load and unload awkward-sized objects, too. Simply slide them on then slide them off.

In fact, the only thing that works as hard as a Mule is Kawasaki's 12-month, limited warranty with no mileage limitation.

Removable side walls and tailgate are available options.

That's why when it comes to settling for anything less than a Kawasaki Mule, people can be darn stubborn. Call: 1-800-661-RIDE for a free brochure and location of your nearest dealer.

Kawasaki

Let the good times roll.

© 1990 Kawasaki Motors Corp., U.S.A. Always wear protective equipment appropriate for the use of the vehicle. See the Owners Manual for more information. Never operate under the influence of drugs or alcohol. Protect the environment. Obey laws and regulations that control the use of your vehicle. The Kawasaki Mule is an off-highway vehicle only and is not designed, equipped or manufactured for use on public streets, roads or highways. Specifications subject to change without notice. Availability may be limited.

Circle No. 113 on Reader Inquiry Card

PRODUCTS

Wood, deck sealer for dimensional stability

Standard Tar Products new USOL Organiclear WDS wood and deck sealer is a penetrating, weather resistant sealer specifically formulated to

help preserve the dimensional stability of untreated and pressure-treated wood.

The ingredients penetrate deeply into the wood to form moisture-guard barriers that repel water droplets, yet allow the wood to breathe. Since it penetrates the surface, WDS will continue to provide water repellancy long after the initial surface beading has receded.

The WDS formulation protects wood from damage due to the elements: sun, sleet and wind-driven rain. Helps prevent wood from splitting, warping, cracking, swelling or shrinking.

The clear finish highlights the wood's natural grain.

If a touch of color is desired, one of several stains may be used. The stains contain inorganic pigments that resist color changes due to exposure to ultraviolet radiation as well as reduce the surface degredation of the wood.

Circle No. 191 on Reader Inquiry Card

New training programs for pesticide applicators

Pesticide Compliance and Training Services, Inc. of North Kingstown, R.I. offers an easy-to-use, verifiable and up-to-date way to train service technicians.

Companies can save payroll and time by using cost-effective training programs which cover numerous aspects of training. Areas covered include pesticide safety and handling, agronomic and horticultural issues, customer sales and service, driver safety, and current federal and state regulations.

PCTS says re-certification of its are often available for certified applicators. PCTS also offers regulatory/environmental compliance audits for the green industry. Items inspected include OSHA, SARA, RCRA, DOT and other pesticide-related responsibilities.

Circle No. 192 on Reader Inquiry Card

Fungicide is pre-mixed, pre-measured, proven

New TwoSome flowable fungicide from Lesco is a combination of chlorothalonil and fenarimol, two proven ingredients for contact and systemic control of most fungal turfgrass diseases.

According to Lesco, TwoSome offers one-container convenience and

EASY COME.

Top row: *Leaf-feeding caterpillar, Mealy bug, Japanese beetle, Bagworm, Gypsy moth.* Bottom row: *Cankerworm, Leaf skeletonizer, Tent caterpillar, Webworm.*

accuracy. Chlorothalonil, a contact fungicide and fenarimol, a systemic fungicide, are specifically formulated in a pre-measured 16:1 ratio to form a liquid product package in a one gallon container. The general use rate of one

gallon per acre aids in measuring convenience.

Lesco says TwoSome effectively controls a broader spectrum of turfgrass plant diseases like summer patch, leaf spot, dollar spot, brown patch and gray snow mold.

Circle No. 193 on Reader Inquiry Card

California accepts product for lawns, ornamentals

California has accepted registration of Tempo 20 WP insecticide for use on home lawns and ornamentals, according to a report from Mobay Corporation.

Mobay says that Tempo, a synthetic pyrethroid, controls more than 40 of the toughest turf and ornamental insects, including aphids, armyworms, whiteflies, thrips and ticks, with significantly less active ingredient than standard insecticides.

"Tempo performs as well as or better than standard insecticides at a competitive price, with up to 80 percent less active ingredient, minimizing environmental impact," notes Dan Meek, Mobay turf and ornamental product manager.

"Excellent insect control with less active ingredient and low human toxicity are tremendous benefits in such an envrionmentally sensitive state," says Meek.

Circle No. 194 on Reader Inquiry Card

continued on page 58

NEW!

EASY GO.

The invasion is coming. An army of hungry insects, ready to destroy everything you've worked so hard to achieve.

But with new TEMPO® insecticide, they're stopped dead in their tracks. On arrival. With excellent residual control. And all while using about 60% less chemical than most of the competition.

It's really a simple idea. Ornamentals need protection when insects mount their attack. With new TEMPO, the battle is over before it's even started. No contest.

Mobay Corporation
A Bayer USA INC. COMPANY
Bayer MOBAY
Specialty Products Group
Box 4913, Kansas City, MO 64120

Tempo is a TM of Bayer AG, Germany. ©1989 Mobay Corp. 62891

Circle No. 137 on Reader Inquiry Card

New loaders compatible with popular tractor

Du-Al's new model 205 and 210 loaders are compatible with the Case-IH models 5130 and 5140 Maxxum tractors.

The loaders mount in minutes thanks to a patented Spee-D-Tach system, which operates with a couple turns of a wrench.

The 2025 and 210 loaders also feature Spee-D-Change attachments for quick-change versatility.

A self-level system on the Du-Al 210 loader helps prevent unnecessary spillage whilc loading.

The 6-, 7- and 8-foot buckets are

located close to the front wheels for good load balance.

Du-Al's 205 and 210 loaders are designed for low maintenance, convenience and operator safety and are available for 2-wheel drive tractors as well as front-wheel assist models.

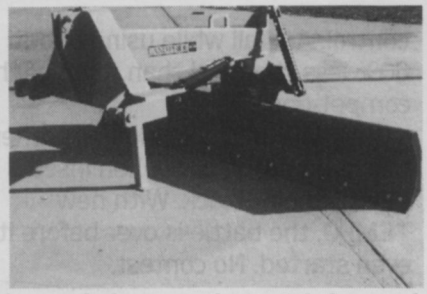
Circle No. 195 on Reader Inquiry Card

New heavy-duty blades hydraulic and adjustable

Land Pride has developed two new series of heavy duty rear blades. The series 45 and 55 rear blades are for 90-hp and 150-hp tractors.

Each blade can be hydraulically offset and hydraulically tilted, and are manually adjustable.

Both the series 45 and 55 blades can



be angled as much as 45° for road grading and windrowing.

A heavy-duty, rolled 19″ moldboard creates consistent and constant dirt flow.

All cutting edges are high carbon, heat-treated and replaceable. A retractable parking stand allows easy hookup.

The full range of options for Land Pride heavy duty rear blades includes skid shoes, side plates and gauge wheels.

Circle No. 196 on Reader Inquiry Card

Mower models feature heavy-duty engines

The Excel Hustler 400 and 440 outfront rotary mowers use liquid-cooled, four-cylinder Ford gasoline engines.

The Hustler 400 sports a 45-hp engine, while the 440 is powered by a 54-hp engine.

Excel reports that both engines are factory-set at 3000 rpm for peak performance and long life, and feature a distributor-less ignition system which reduces routine maintenance.

Both the 400 and 440 feature the Hustler dual-hydrostatic drive system, which is combined with twin-level steering for true zero-degree radius turning. One-hand control provides unmatched maneuverability in braking and forward and reverse turns.

Circle No. 197 on Reader Inquiry Card

Control products available in quart-sized containers

Ciba-Geigy introduces new quart containers for its Triumph insecticide, Banner fungicide and Pennant herbicide.

The new quart containers are an advantage primarily to first-time and small-quantity users of the products, according to Larry Dull, senior group leader of packaging application and development.

"The new containers make the products more convenient for users who don't need a gallon or more of the products on hand," says Dull.

"In addition, first-time users can sample the products easily, small quantity use is simpler and site-to-site transportation is easier."

Recent label amendments allow Banner to be used to control gray leaf-spot on St. Augustinegrass, and gray and pink snow mold on all labeled grasses. The new label also allows the product to be used for broad-spectrum disease control on virtually all nursery (field) ornamental plants.

Pennant's new label allows use on virtually all landscape and nursery planting, including residential land-

scapes. In addition, Pennant can be used on more ornamental plants to control more weeds and grasses.

Triumph is a restricted-use insecticide for use only by certified applicators for insect control in lawns.

Circle No. 198 on Reader Inquiry Card

Mower improvements for easy operation

The Toro Company has introduced improvements to its heavy-duty line of ProLine mowers which increase ease of operation and performance.

Toro has added a new self-propelling system for longer life, a new fuel tank which is 33 percent larger and Vac-U-Power blades for improved bagging.

Toro reports that in tests with commercial cutters, the new self-propelling system lasted three times longer than standard systems.

The redesigned transmission includes new needle bearings with grease seals on the output shaft for increased durability.

The transmission's center pull engagement allows for equal load on the bearings instead of loading one side.

The reversed gear sequence has a third gear in the center to match up with the center pull engagement to allow for equal load on the output shaft.

Also included in the new self-propelling system are plastic double-seal wheel covers and sealed pivot arms which keep out sand and debris.

Circle No. 199 on Reader Inquiry Card

continued on page 62

WE REACH THE PEOPLE YOU NEED TO REACH!

Place a classified ad in any of these EDGELL COMMUNICATIONS' publications and you know your ad dollar is wisely spent.

Circulation	Magazine	Circulation	Magazine
22,587	AFTERMARKET BUSINESS	47,780	LANDSCAPE MANAGEMENT
13,252	AMERICAN AUTOMATIC MERCHANDISER	13,589	LAWN CARE INDUSTRY
135,134	AMERICAN SALON	15,209	LP/GAS
12,821	AQUA	17,322	MEAT PROCESSING
29,475	BEVERAGE INDUSTRY	14,496	NEUROLOGY
10,484	BODY FASHIONS/INTIMATE APPAREL	15,686	OPHTHALMOLOGY TIMES
3,119	CANDY INDUSTRY	13,797	PAPERBOARD PACKAGING
11,247	CANDY MARKETER	12,889	PAPER SALES
50,381	COMMUNICATIONS NEWS	16,335	PEST CONTROL
20,469	CONCRETE PRODUCER NEWS	19,656	PETROLEUM ENGINEER INTERNATIONAL
102,224	DENTAL MANAGEMENT	14,105	PETS SUPPLIES MARKETING
7,084	DERMATOLOGY TIMES	24,044	PIPELINE & GAS JOURNAL
12,777	DRUG & COSMETIC INDUSTRY	21,672	PIT & QUARRY
35,707	DVM NEWSMAGAZINE	10,100	POULTRY PROCESSING
24,546	FLOORING	20,281	ROOFING/SIDING/INSULATION
77,365	FOOD & DRUG PACKAGING	9,369	SNACK FOOD
62,170	FOOD MANAGEMENT	41,293	TELEPHONE ENGINEER & MANAGEMENT
19,051	HEARING INSTRUMENTS	9,056	UROLOGY TIMES
45,148	HOTEL & MOTEL MANAGEMENT	21,000	WORLD COGENERATION
13,833	HOUSEWARES		

Don't forget that classified advertising works just as effectively in locating employees as it does if you are looking for a position, have a line, machinery or a business to sell, are seeking representatives or wish to buy a specific item. Let it go to work for you!

EDGELL COMMUNICATIONS does a better job of reaching those who count (*your potential customers*) than any other business publisher.

COUNT ON US TO REACH THOSE WHO COUNT!

Call Dawn Nilsen at 218-723-9200
Fax: 218-723-9615

EDGELL COMMUNICATIONS
One East First Street
Duluth, Minnesota 55802

J

BARK RENEWER™ for Decorative Bark & Wood Chips

- *Resists sunlight discoloration*
- *Moisture-guard protection*
- *Reduces landscaping costs*
- *Concentrate or Ready-to-Use*

HONEY, WALNUT BROWN & CALIFORNIA REDWOOD

ORGANICLEAR™

Premium Wood Preservatives
Stains and Sealers

800-825-7650

STANDARD TAR PRODUCTS CO., INC.
2456 West Cornell Street
Milwaukee, WI 53209

Circle No. 131 on Reader Inquiry Card

PRODUCTS *from page 58*

Hill climbing a specialty with four-wheel drive

Jacobsen's versatile Turfcat T422D now features an on-demand four-wheel drive. A differential lock gives the T422D even greater traction to tackle slopes too steep for two-wheel

drive mowers.

Jacobsen reports that the Turfcat T422D has a low maintenance, liquid-cooled diesel engine for years of trouble free service. A high efficiency hydraulic implement drive provides smooth, quiet power to attachments.

The Turfcat can be equipped with front mounted 60- and 72-inch rotary mowing decks, or Jacobsen's 60-inch fine-cut flail. In addition, a snow thrower, straight blade, blower or rotary brush can be connected to the T422D for all-season maintenance work.

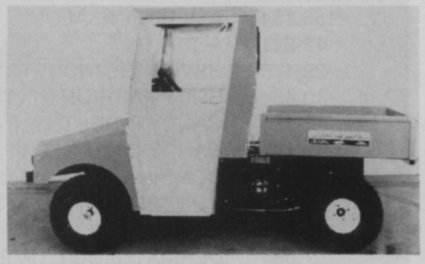
Circle No. 200 on Reader Inquiry Card

New four wheeler priced to be competitive

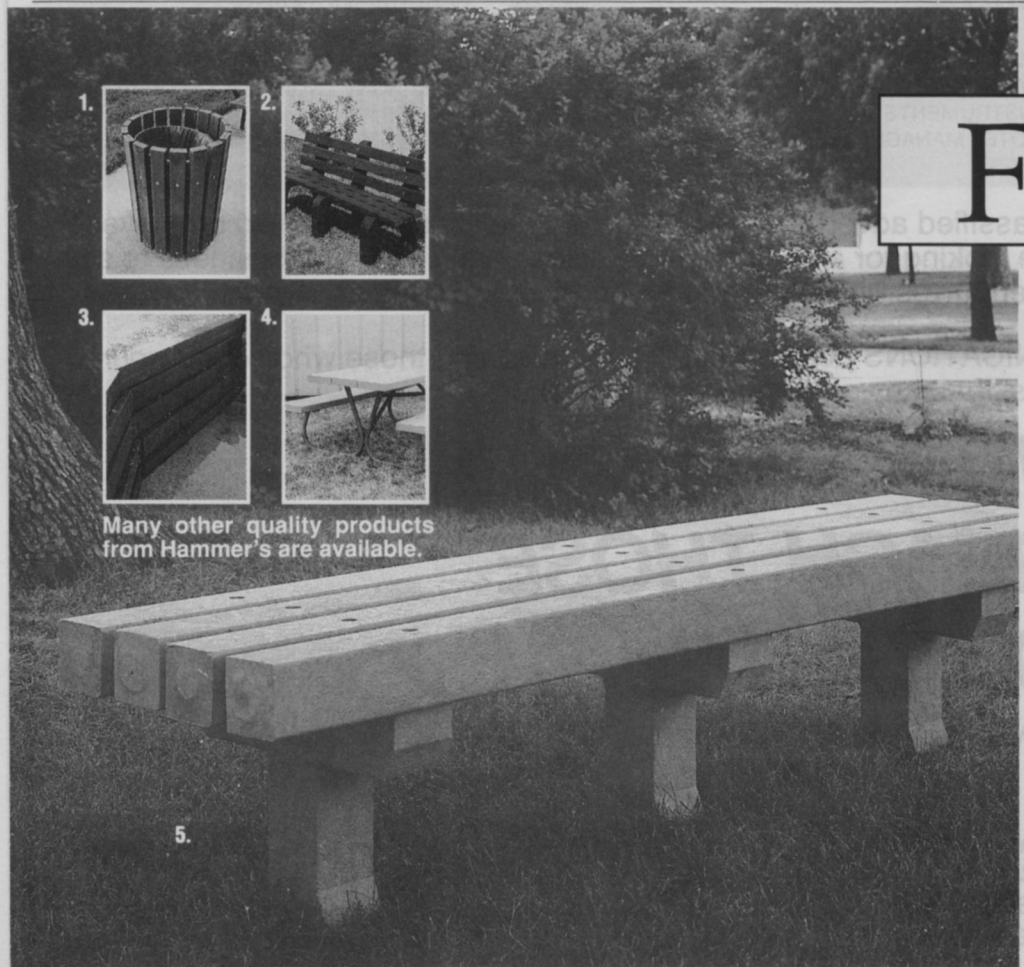
Haul Master has introduced a four-wheel utility vehicle for use in governmental, municipal, commercial and industrial applications.

The model HX-4480F-B is equipped with a 16 hp, 440 cc, overhead valve Briggs & Stratton engine. Haul Master says it is offered at a lower price than any comparable vehicle on the market.

Standard features include electronic ignition, automatic transmission, automotive style controls and steering wheel, hydraulic disc brakes and more. Options include dual fuel tanks, steel cab, turn signals, and hydraulic tilt cargo bed.



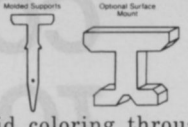
Circle No. 201 on Reader Inquiry Card



FROM WHERE WE'RE SITTING

Hammer's Park Benches are built to last. They're made from durable 100% recycled plastic that offers a high quality, cost effective, ***low maintenance alternative.***

Hammer's Park Benches come in either 4' or 6' lengths, and can be secured by either surface or T-stake mounts.



Solid coloring throughout means no painting or fading, backed by our ***five-year limited warranty.***

Hammer's: Building the best, ***while protecting our environment.***

HAMMER'S PLASTIC RECYCLING CORP.
A Manufacturer of Recycled Plastic Products

RR 3, Box 182 (515) 648-5073
Iowa Falls, Iowa 50126

HPR-PB1

1. Garbage Can 300*
2. Landscape Timbers 301*
3. Picnic Table 302*
4. Dura Bench 303*
5. Hi-back Bench 304*

*Indicates Reader Service Number for individual product.

Answers to the seven most asked questions about SUPERSORB.®

When we introduced SUPERSORB® water absorbants a few years ago we were confident that they would be successful, but we had no idea that this practical and versatile water management tool would generate so much enthusiasm among landscape professionals.

We,ve compiled some of the most frequently asked questions and answers. If your questions aren't answered here, give us a call toll-free at the number below.

Q: What is SUPERSORB and what does it do?

A: SUPERSORB is a water absorbant. It consists of acrylic copolymer crystals which absorb water to increase the moisture holding capacity of soil. SUPERSORB crystals can absorb up to 200 times their weight in water and release nearly 100 percent of their reserves as the soil dries out or plants require it. SUPERSORB keeps on working for at least two years. It is non-toxic to plants, people and animals, and is eventually metabolized by soil microorganisms.

Q: What will SUPERSORB do for me in landscape installation and maintenance?

A: SUPERSORB C lets you and your customers extend the time between waterings. It helps trees, shrubs, bedding and container plants and ground covers survive moisture stress conditions. SUPERSORB F can be used as a rootdip for bareroot plants, added to hydroseeding mixtures or used to speed the establishment of sod. So SUPERSORB saves you time and water and gives you better plant establishment.

Q: What's the difference between SUPERSORB and other water absorbants on the market?

A: Aside from SUPERSORB's unique blue color, which is helpful when mixing it into the soil, you'll find that SUPERSORB's particle size is more uniform for more predictable performance. In addition, SUPERSORB is backed by AQUATROLS' customer service and 35 years of experience.

Q: Which particle size, Coarse or Fine should I use?

A: We recommend SUPERSORB C, Coarse Particle (1-2mm) for transplanting trees and shrubs, amending the soil in beds, containers and hanging baskets. SUPERSORB F, Fine Particle (<.5mm) is used for hydroseeding, installing sod, seeding and for root dipping bareroot stock.

Q: Will SUPERSORB waterlog the soil or take water away from plant roots?

A: No to both questions. SUPERSORB expands into discrete chunks; it doesn't form a soggy mass. As SUPERSORB expands and contracts it actually helps keep the soil or container mixes open and loose. Since water must be in a free state for SUPERSORB to absorb it, water clinging to soil particles or within plant root tissues cannot be absorbed by the crystals.

Q: How much does SUPERSORB cost to use?

A: It costs about $.50 to amend the backfill for a tree or shrub with a one foot in diameter rootball.

Q: Where can I buy SUPERSORB?

A: From the turf and hort supply distributors throughout North America. If your distributor doesn't stock SUPERSORB, accept no substitutes. Call us toll free and we'll give you the name of the nearest SUPERSORB distributor.

Call us for further information, technical service or a free sample. **1-800-257-7797, in N.J. (609) 665-1130.**

AQUATROLS

The Water Management People

1432 Union Ave., Pennsauken, NJ 08110 FAX: (609) 665-0875

Circle No. 102 on Reader Inquiry Card

CLASSIFIED

RATES: $1.20 per word (minimum charge, $35). Bold face words or words in all capital letters charged at $1.45 per word. Boxed or display ads: $100 per column inch-1x (one inch minimum); $95-3x; $90-6x; $85-9x; $80-12x. (Frequencies based on a calendar year). Agency commissions will be given only when camera-ready art is provided by agency. For ads using blind box number, add $15 to total cost of ad. Send ad copy with payment to Dawn Nilsen, LANDSCAPE MANAGEMENT, 1 East First Street, Duluth, MN 55802 or call 218-723-9505. Fax Number 218-723-9615.

BOX NUMBER REPLIES: Mail box number replies to: LANDSCAPE MANAGEMENT, Classified Ad Department, 1 East First St., Duluth, MN 55802. Please include box number in address.

BUSINESS OPPORTUNITIES

CURBMATE. The growth industry of the 90's is concrete landscape edging installed by the Curbmate machine. Excellent profits, low overhead, low start-up. $5,495. Call 801-273-3938. 6/90

LEARN Professional Landscaping and Gardening at home. Accredited program provides thorough training in all phases of commercial and residential landscaping. Certificate awarded. Free booklet describes program and opportunities in detail. Lifetime Career Schools, Dept. A-415, 2251 Barry Ave., Los Angeles, CA 90064. 9/90

WANT TO BUY OR SELL A GOLF COURSE? Exclusively golf course transactions and appraisals. Ask for our catalog. McKay Golf and Country Club Properties, 15485 N. East Street, Lansing, Michigan 48906. Phone (517)484-7726. TF

SELLING- BUYING- EXPANDING A GREEN INDUSTRY BUSINESS? Any size, any type, anywhere in the United States. Confidentiality maintained. Valuations, sales, mergers, acquisitions, analysis of operations. **NILSSON ASSOCIATES-GREEN INDUSTRY CONSULTANTS. (203-621-6199).** TF

CURB KING: Curbing machine that lays continuous concrete landscape borders. $2695.00. Low investment, high returns. For information call 303-434-5337 or write PO Box 40567, Grand Junction, CO 81504. 8/90

HELP WANTED

IRRIGATION SPECIALISTS - Time for a move to the drought stricken San Francisco Bay area - Excellent opportunities - Join an Environmental Care, Inc. team. Send resume to 825 Mabury Road, San Jose, CA 95133. 7/90

"Consider all of your employment options in the irrigation and landscape industries. Call **Florapersonnel,** the international employee search firm for the ornamental horticulture industry. Completely confidential. Employer pays fee. **Florapersonnel, Inc.,** P.O. Box 1732, 1450 S. Woodland Blvd., Suite 201, DeLand, FL 32721-1732. (904)738-5151. Jeff Brower, Joe Dalton, David Shaw, CPC, Bob Zahra, CPC." TF

LANDSCAPE FOREMAN: Progressive company, competitive pay/benefits. Start immediately. Year-round employment. Apply or phone **HAWKS NURSERY CO.,** 12217 Watertown Plank Road, Wauwatosa, WI 53226. Ken or Jim, 414-258-4090. 6/90

LANDSCAPE DESIGNER/SALESPERSON: Long-established design/build landscape firm has opening for landscape designer/salesperson. Three to five years design/build experience required. Send detailed resume to **HUNZIKERS INC.,** P.O. Box 397, Niles, MI 49120. 6/90

GOLF COURSE SUPERINTENDENTS AND ASSISTANTS: Innisbrook, Florida's premier golf resort, is currently recruiting and accepting resumes for Superintendents, Managers and Supervisors. We have 63 holes of Florida's finest golf. Excellent company benefit program including bonus and clubhouse membership, go with these positions. We offer opportunities for advancement to quality oriented individuals with a desire for career advancement. Minimum requirements: A degree in Golf Course Management, Agronomy or related fields. A 2 year degree candidate with no previous supervisory experience will have a starting salary of $19,500 per year. A candidate with 4 or more years of golf course supervisory experience, salary range is up to $27,500 depending on previous experience. A 4 year graduate holding a BA/BS degree along with 4 or more years of experience as a golf course manager or superintendent can expect a salary in the range of $35,000 per year to $50,000 per year depending on previous experience. Join a team of professionals. Send resume to: Mr. J. Arlin Grant, Vice President, Grounds Maintenance Dept., Innisbrook Resort, P.O. Box 1088, Tarpon Springs, FL 34688-1088; or phone (813)942-2000 to schedule an interview date. Proof of legal residency is required. EOE. 6/90

BRANCH/SALES MANAGERS; JUNIOR AND SENIOR LEVEL. Orkin Lawn Care offers more to our Managers, so why settle for less? Our company is a leader in its field and expansion dictates the need for senior level Branch and Sales Managers to maintain our high-standards and the integrity that has built the Orkin reputation. We offer unlimited room for advancement into top-level management, salary plus incentive bonus, and a comprehensive benefits package to talented, ambitious Orkin team members who are dedicated to success. You will report directly to Zone Managers and be required to: *Initiate and develop effective work atmosphere, *Meet financial objectives — revenue, cost control, profits and profit margins. *Enforce Orkin policies and procedures *Maintain a strong customer base *Select and train new employees. If you can fulfill these objectives and have the aptitude to prioritize duties and projects, send a confidential resume to: **ORKIN LAWN CARE, PAT GUY,** 2170 Piedmont Road, Northeast, Atlanta, GA 30324. 6/90

KT ENTERPRISES, INC., a commercial landscape management firm servicing the Washington, DC Metropolitan market, is now accepting applications for all departments for the 1990 season and beyond. All positions offer excellent salary, health benefits, retirement and, most importantly, an incomparable opportunity to work in a quality organization that will continue to offer professional satisfaction. All applicants should be experienced. Please send resume to Martha Sharlot, KT Enterprises, Inc., 4001 Westfax Drive, Fairfax, VA 22021. **LANDSCAPE MAINTENANCE:** Floral Installation Specialists, Turf and Ornamental Specialists, Pruning Specialists, Maintenance Supervisors. **LANDSCAPE INSTALLATION:** Landscape Supervisors, Landscape Installation Foremen, Hardscape Specialists, Equipment Operators. **IRRIGATION INSTALLATION: Installation Supervisors, Installation Foremen, Golf Course Irrigation Specialists. SALES: ALL DEPARTMENTS:** Sales Representatives, Designers, Estimators. 6/90

LANDSCAPE MAINTENANCE PRODUCTION MANAGER: Rapidly growing Central Florida Landscape firm seeking an experienced production manager with strong people and organizational skills. Experience with large commercial accounts and a sincere desire to build a business based on customer service a must. Strong Salary and Benefits. Must relocate to Orlando. Send resume to: Mr. Khalsa, 1174 Florida Central Pkwy., Longwood, Florida 32750. 6/90

WANTED - MANUFACTURERS REPRESENTATIVES AND DISTRIBUTORS - to represent a line of high quality hydroseeding tackifiers. For more information, contact PRSM, Inc. at (215)430-3960. 8/90

Assistant Sales Representative: One of the nation's top fifty landscape contractors needs a self motivated individual to assist in sales of construction and maintenance in Atlanta, Georgia. Must have a degree in horticulture or landscape architecture and some sales background. Good communication skills, professional appearance, and eagerness to learn our methods are essential. Salary commensurate with experience. Send resume to POB 675831, Marietta, GA 30067-0022 or Fax to (404)956-0140. 6/90

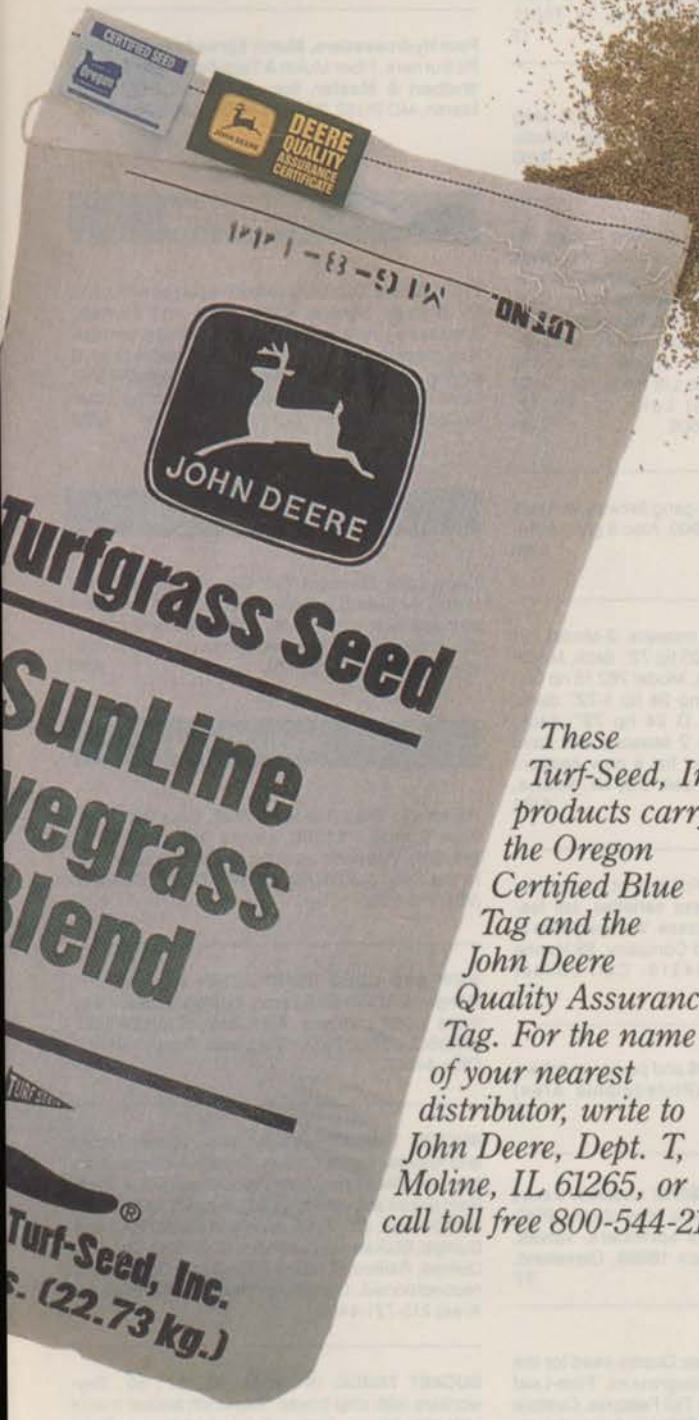
LANDSCAPE DIVISION MANAGER: well established, rapidly growing company seeks individual to take over for retiring manager. Individual must be able to run both a maintenance and a planting division simultaneously. Requires exceptional organizational/management skills as well as complete command of plant materials and maintenance techniques. For consideration contact David Gorter, 855 Skokie Highway, Lake Bluff, IL 60044. 708-615-0800. 7/90

LANDSCAPE MAINTENANCE MANAGER: San Francisco East Bay Area property management company has immediate opening for results-oriented manager to administer and direct the Landscape Maintenance function for an 1800 acre retirement community's residential and light commercial property. Approximately 9,000 residents, budget $3 million. Up to 70 employees. B.S. in Horticulture supplemented by significant directly related commercial sector management employment, which has provided familiarity with computerized M.I.S., is preferred. Customer service orientation and written and oral communication skills essential. We are prepared to offer a competitive salary commensurate with experience and an excellent benefits program. Qualified applicants may submit resume, including salary requirements to: Personnel Director, Golden Rain Foundation, Rossmoor, Walnut Creek, P.O. Box 2070, Walnut Creek, CA 94595. 415-939-1211 X304. 6/90

NEED LANDSCAPE WORKERS? We can solve any labor problem you have. We have documented workers as well as foremen, leadmen, irrigators and architects available at a price you can afford. Call today! **AMIGOS 214-634-0500.** TF

Grass seed from Deere? It's only natural.

Look into our New Fall Lines:



These Turf-Seed, Inc. products carry the Oregon Certified Blue Tag and the John Deere Quality Assurance Tag. For the name of your nearest distributor, write to John Deere, Dept. T, Moline, IL 61265, or call toll free 800-544-2122.

SunLine
Perennial ryegrass blend for winter overseeding, fairways and hard-use areas.

DuraLine
Tall Fescue blend for golf course roughs, athletic fields and home lawns.

GoalLine
Kentucky bluegrass and perennial ryegrass mixture for fairways and athletic fields.

ParkLine
One-third each, bluegrass, ryegrass and fine fescue for fairways, parks and athletic fields.

ShadowLine
Fine fescue blend for shady and low maintenance areas.

BlueLine
Kentucky bluegrass blend for fairways, athletic fields and sod production.

JOHN DEERE

Nothing Runs Like a Deere®

Circle No. 136 on Reader Inquiry Card

Expanding Northeast Ohio Maintenance and Construction Company has openings at the Foreman level. Fulfill your career goals with a 6 million dollar company that is still growing. Send your resume and salary requirements to Mr. Herrmann, P.O. Box 438, Painesville, Ohio 44077-0438. 7/90

FOR SALE

NEW FIRST VIDEO CASSETTE ON NUISANCE WILDLIFE REMOVAL NEW

SAVE YOURSELF OR YOUR EMPLOYER BIG $$$

Trap skunks, raccoons, squirrels, woodchucks and other animals from buildings or grounds.

This is an instructional video cassette providing basic procedures to trap and remove nuisance wildlife. This video discusses types of equipment, selection of baits, professional trapping procedures, animal behaviors, live trapping cases, and more.

Cost $39.95 plus $2.05 shipping & handling
Send check or money order only to:

Pest Wildlife Removal Services
P.O. Box 5628, Harrisburg, PA 17110-0628
PA residents add 6% sales tax. Allow 2-4 weeks for delivery.

GARDEN CENTER AND NURSERY FOR SALE: Includes building, equipment, and real estate. Steady growth pattern, excellent business reputation, retirement necessitating sale. Price: $191,500 (terms to qualified buyer). Contact Century 21 Prime Realty, 329 W. Washington St., Marquette, MI 49855. (906)228-5230. 6/90

FOR SALE: Discount Parts & Supplies Inc. We supply landscape companies with quality replacement parts including blades, engines, belts, monofilament line, pulleys, tires and wheels. We also carry a full line of spreaders, filters, two cycle oil & bags. Call for a free catalog 1-800-462-9486. 6/90

ZOYSIA MEYERS Z-52 SOD OR SPRIGS. EXCELLENT QUALITY DELIVERED ANYWHERE AT REASONABLE PRICES. ALSO ROW PLANTING AVAILABLE. DOUBLE SPRINGS GRASS FARM, SEARCY, AR. 1-800-458-4756. TF

For Sale: 914 Acres, Wisconsin Sod business & equipment. 2 sets of buildings will split $700 per acre. Ryan 18" Sod cutter $950. Ryder $1450. Wanted - Roseman gang mowers. 414-326-5267. 6/90

NEW AND USED BROUWER EQUIPMENT: Mowers - VACS - Fork Lifts - Harvesters - and full line of replacement parts. Contact Glenn or Ed Markham at 1-800-458-3644. TF

Bulk bark mulch and woodchips, hardwood, pine, and cypress, lumber, timbers, stone products. Many other landscape and nursery supplies. Express delivery, next day shipment. LANDSCAPE SUPPLY HOTLINE! Garick Corporation and Landscapers Wholesale Inc., 1-800-631-1395. 6/90

FOR SALE: 1984 Diesel Spyder, Extended Forks, 500 Hours, Trailer, Excellent Condition, Call Tim - (313)522-3800. 6/90

FOR SALE - Jacobsen F10 7 gang, rebuilt motor, very good condition. 100% ready for Spring! $7,500. 1984 Toro 7 gang reelmasters 10 blade reels, sharpened. $5,300. Also Toro 7 gang spartans, sharp. $4,800. Jake fairways 7 gang rebuilt, sharpened 10 blade. $4,500 firm. Photos available. (313)743-7594 after 7 pm. 6/90

HYDRO-MULCHERS AND STRAW BLOWERS New and used. **JAMES LINCOLN CORPORATION,** 3220 S. Jupiter Rd., Garland, TX 75041. (214)840-2440, (800)527-2304. TF

PORTABLE STUMP CUTTER - 14 or 16 H.P. Mag Kohler, 4 speed transaxle - 34 1/2" wide. Kinetic Stump Cutter, Inc. 1-800-422-9344. 9/90

SPYDERS - New/Used/Rebuilt. New Kohler engines, short blocks and a complete line of engines and Spyder replacement parts. New Style Nichols-Fairfield Torque Hub Kits, heavy duty Wilton Caster Kits, Remote Air Cleaner Kits, heavy duty Carriage Side Plates. We repair and rebuild hydraulic pumps and motors for your Spyder. Same day service. Call or Write: Mobile Lift Parts, Inc., 5402 Edgewood Rd., Crystal Lake, IL 60012. 815-455-7363; 1-800-397-7509. 7/90

JACOBSEN AND TORO: 7 gang fairway mowers rebuilt and sharpened - $4,900. Also 5 gang available. (313)653-5695. 6/90

Husler zero turning radius mowers: 2-Model 251 18 hp 50" deck, Model 272 23 hp 72" deck, Model 305D diesel 20 hp 72" deck, Model 262 18 hp 60" deck, Model 400 Rangewing 24 hp 1-72" deck, 2-40" decks, Model 400 D 24 hp 72" deck. *Mowers only in operation 2 seasons and have been completely renovated for a new season. Owner highly motivated to sell. Call Mr. Khalsa. 407-831-8101. 6/90

LAWN SEED: Wholesale. Full line of top quality grasses. Improved bluegrass varieties, tall fescues and fine bladed ryegrasses. We specialize in custom mixing. Oliger Seed Company, 89 Hanna Parkway, Akron, OH 44319. Call collect (216)724-1266. TF

REINCO HYDROGRASSERS and power mulchers in stock. Opdyke Inc. (Philadelphia Area) 215-721-4444. TF

PIPE LOCATOR INEXPENSIVE! Locates, traces underground drain, water pipe lines of clay, PVC, ABS, steel, cement. Finds sprinklers, valves, clogs. Bloch Company, Box 18058, Cleveland, Ohio 44118. (216)371-0979. TF

PAUL FLORENCE Turfgrass: Quality seed for the Turf Professional. Elite Bluegrasses, Fine-Leaf Ryegrasses, and Turf-Type Tall Fescues. Custom mixing our specialty. Silva-Fiber mulch and supplies for hydro-seeders. Quality Elite Bluegrass Sod. Call us! (513)642-7487. 13600 Watkins Rd., Marysville, OH 43040. TF

FOR SALE/ BUSINESS: Landscape construction and maintenance business for sale in beautiful Sun Valley, Idaho. The sale also includes a 4 bedroom, 2 bath, home with office and shop. This is an incredible opportunity to own a 10 year old business that is highly respected and profitable. There is unbelievable potential for future growth in this booming resort community. Call or write Bill Pereira, P.O. Box 1755, Hailey, Idaho 83333. (208)788-4447. 7/90

Jacobsen F-10 7 gang. Excellent condition. New paint, new bed knives sharpened and ready to mow. Asking $8,000. 414-835-4441. 6/90

Finn Hydroseeders, Mulch Spreaders, Krimpers, Pit Burners, Fiber Mulch & Tackifiers. New & Used. **Wolbert & Master, Inc.,** P.O. Box 292, White Marsh, MD 21162, 301-335-9300, 1-800-234-7645. TF

MISCELLANEOUS

FREE CATALOG: Guaranteed replacement parts for Bobcat, Bunton, Kees, Scag and Exmark. Wholesale prices on blades, belts, filters, trimmer line, grass catchers and engines. If you're tired of paying big money for parts call (800)343-4333. Lawn Care Parts Unlimited delivers savings Coast to Coast!! 6/90

POSITION WANTED

Lawn Care Manager/Turf Care Products Sales: Highly motivated individual with 8 years lawn care management experience, plus sales background in turf care products sales, seeks position in Florida. Reply to LM Box 479. 6/90

USED EQUIPMENT

Roker 40" Tree Spade - $3800. Hydrobrute 30" Tree Spade - $2500. Lindig Soil Shredder - $19,500. All in good working condition, ready to go to the field. **CLOVERDALE NURSERY,** Boise, ID (208)375-5262. 6/90

NEW and USED EQUIPMENT--Asplundh, Hi Ranger and Lift-all forestry bucket trucks, Chipmore wood chippers. Mirk, Inc., (216)669-3567, (216)669-3562, 7629 Chippewa Road, Orrville, Ohio 44667. TF

BUCKET TRUCKS, Straight Stick, Corner Mount and Knuckle Boom Cranes. Brush Chippers - New Morbark Disc Type, New Woodchuck Drum Type. Best prices anywhere. Used Chippers - Asplundh, Woodchuck, etc. 2 to 8 usually in stock. Sprayers, Dumps, Stakes, Log Loaders, Crew Cab Chip Box Dumps, Railroad Trucks, 50 in stock. Sold as is or reconditioned. Opdyke's, Hatfield (Philadelphia Area) 215-721-4444. TF

BUCKET TRUCK: Hi Ranger 65', 57', 50'. Skyworkers with chip boxes. Asplundh bucket trucks with chip boxes. Asplundh brush chippers. Bean 55 gal. sprayers. Pete Mainka Enterprises, 633 Cecilia Drive, Pewaukee, WI 53072. 414-691-4306. TF

ADVERTISER INDEX

101 Adikes, Inc., J.A. 28
102 Aquatrols Corp of America 63
BASF Corp 43
103 Barebo, Inc. 31
135 Ciba Geigy Corp./ Subdue 53
104 Ciba Geigy Corp./ Banner 7
106 Cushman 37
107 Deere and Co., John 16-17
108 Eco Health 20
109 Ford New Holland, Inc. 33
110 Growth Products . . . 12
300 Hammer Co. 62
301 Hammer Co. 62
302 Hammer Co. 62
303 Hammer Co. 62
304 Hammer Co. 62
111 Jacobsen Div. of Textron 27
112 Jacobsen Div. of Textron 27
113 Kawasaki Motors Corp. 55
114 Lebanon Chemical Corp./ 18
115 Lesco Inc. 19
116 Lofts Seeds, Inc. . . CV 4
117 Mobay Corp./ Dylox Oftanol 34-35
118 Mobay Corp./ Dylox 25
119 Mobay Corp./ Morestan 38-39
120 Mobay Corp./ Dyrene 2-3
121 Mobay Corp./ Nemacur (Reg.) . . 44-45
122 Mobay Corp./ Oftanol 41
123 Mobay Corp./ Dyrene CV3
124 Mobay Corp./ Tempo 56-57
125 Nor Am Chemical Co./Banol 21
126 Nor Am Chemical Co./Proxol 47
127 Olathe Manufacturing, Inc. 14
105 Rhone Poulenc/ Mocap 15
128 Rhone Poulenc Ag Co./Mocap 15
129 Rhone Poulenc Ag Co./Aliette 29
130 Sandoz Crop Protection Corp. 84
131 Standard Tar Products Co. 62
132 Tee 2 Green Corp. CV2
133 Turf Seed, Inc. 5
134 Valent U.S.A. Corp. . 13

This index is provided as an additional service. The publisher does not assume any liability for errors or omissions.

send a Classified Advertising message...

...write here.

(Please Print) _____

1. Number of insertions: (circle) 1 2 3 6 12 TF (Til Forbid)
2. Start with (month) _____ issue. (Copy must be in by 5th of month preceding)
3. Amount enclosed: $_____

To keep our rates as low as possible, payment must accompany order.

SIGNATURE _____ DATE _____

NAME _____ COMPANY _____

STREET _____

CITY _____ STATE _____ ZIP _____

PHONE NUMBER _____

MAIL AD COPY TO: Dawn Nilsen, **LANDSCAPE MANAGEMENT,** 1 East First Street, Duluth, MN 55802.

RATES: $1.20 per word (minimum charge, $35). Boldface words or words in all capital letters charged at $1.45 per word. Boxed or display ads: $100 per column inch, one time; (one inch minimum); $95, three times; $90, six times; $85, nine times; $80, twelve times. (Frequencies based on a calendar year). For ads using blind box number, add $15 to cost of ad.

PROBLEM MANAGEMENT

by **Balakrishna Rao,** Ph.D.

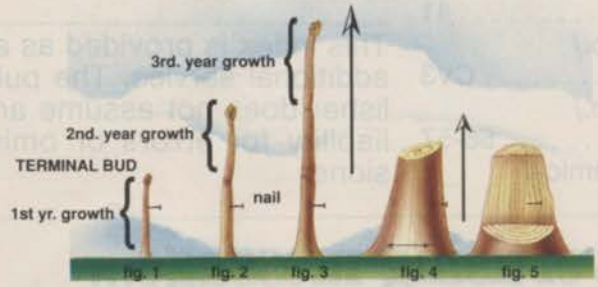
'How do trees grow?'

Problem: *I have been employed in the parks department of the city of Galesburg, Illinois for about 12 years. I had never given much thought about the growth of trees until a new employee asked, 'How do trees grow?' One of the old-timers responded, 'From the top up,' and said that if you drove a nail into a young tree you would find it at the same elevation 50 years later.*

I find that hard to believe. When I look at a tree that's 50 feet high and see a crotch that's 10 feet above the ground, I can't believe the tree was that tall when it was planted, or that all the previous features disappeared, leaving the crotch.

I know that a tree feeds down from the leaves and then again up from the roots. But does it grow up and out? (Illinois)

Solution: The "old timer" on staff proves that there's no teacher like experience. Trees do grow from the top up. This drawing and explanation should help you understand the situation.



Trees grow from the top up from the terminal bud (Fig. 1). These terminal buds are produced every year at the tip of the current year's growth. From this new terminal bud, new growth will be reproduced during the following growing season, usually in spring (Figs. 2-5). The stem will elongate for a period (depending on species and growth habit) and then stop growing and develop a new terminal bud for future growth.

The yearly growth and elongation and terminal bud setting process will continue as the trees grow from the top upward. Depending on growing conditions—such as soil, environment and fertilization—a given tree may produce different lengths of growth during different years. So stem (or trunk) elongation occurs each year as new growth occurs from the terminal bud. Pre-existing stem tissue does not elongate.

Because of the tree's growth habit, if the nail was driven into the current season's growth before the yearly elongation process stops, the final elevation of the nail may be slightly higher than the original height. However, if the nail was introduced after the elongation process was stopped, it will stay at the same elevation thereafter.

You are also correct in saying that trees grow up and out. As far as upward growth, refer to the above explanation.

The outward growth takes place from a layer of tissue (cambium) located between the xylem and phloem. The cambium layer is responsible for secondary and outward growth. It produces xylem (sapwood) inward and phloem and bark tissue outward. So the outward growth we see on any tree is due to cambial activity. Every year this will produce growth layers, one outside the other, which are called "growth rings" without any elongation upward. Because of the outward growing habits of trees, a nail or any other foreign objects, such as wire or systemic injection tools left over, can be gradually enclosed inside by growth layers and the callosing process.

Treating snow mold

Problem: *A number of our clients' lawns had snow mold disease problems in past years. What is the best way to manage this problem? (Pennsylvania)*

Solution: Success in snow mold disease management depends on properly diagnosing the causal agents and following good management guidelines. Since we do not have a good broad-spectrum fungicide to manage all snow mold diseases, proper identification is very important.

Several different fungal agents can cause turf disease at low temperatures. Among these are pink snow mold (fusarium patch) caused by *Fusarium nivale* and gray snow mold caused by *Typhula spp.*, which are the two most common and important snow mold diseases and are active during the winter months.

Pink snow mold is characterized by reddish-brown spots with pinkish colored margins. Pinkish mycelial growth may be present at the border of patches in the early morning. Gray snow mold has gray to black mycelium with hardened yellow-brown fungal bodies (sclerotia) embedded in the leaf and crown of infected plants.

Often snow mold problems can be managed successfully by following good cultural practices. Avoid heavy fertilizing late in the fall that produces lush growth. Continue mowing until turfgrass growth stops, and manage whatever thatch problem may exist.

Since snow molds usually kill only the turfgrass leaves, rake and break up infected and matted leaves to encourage new tiller growth from the crown. This should be done before the grass greens up in the spring and prior to pre-emergence crabgrass herbicide application(s).

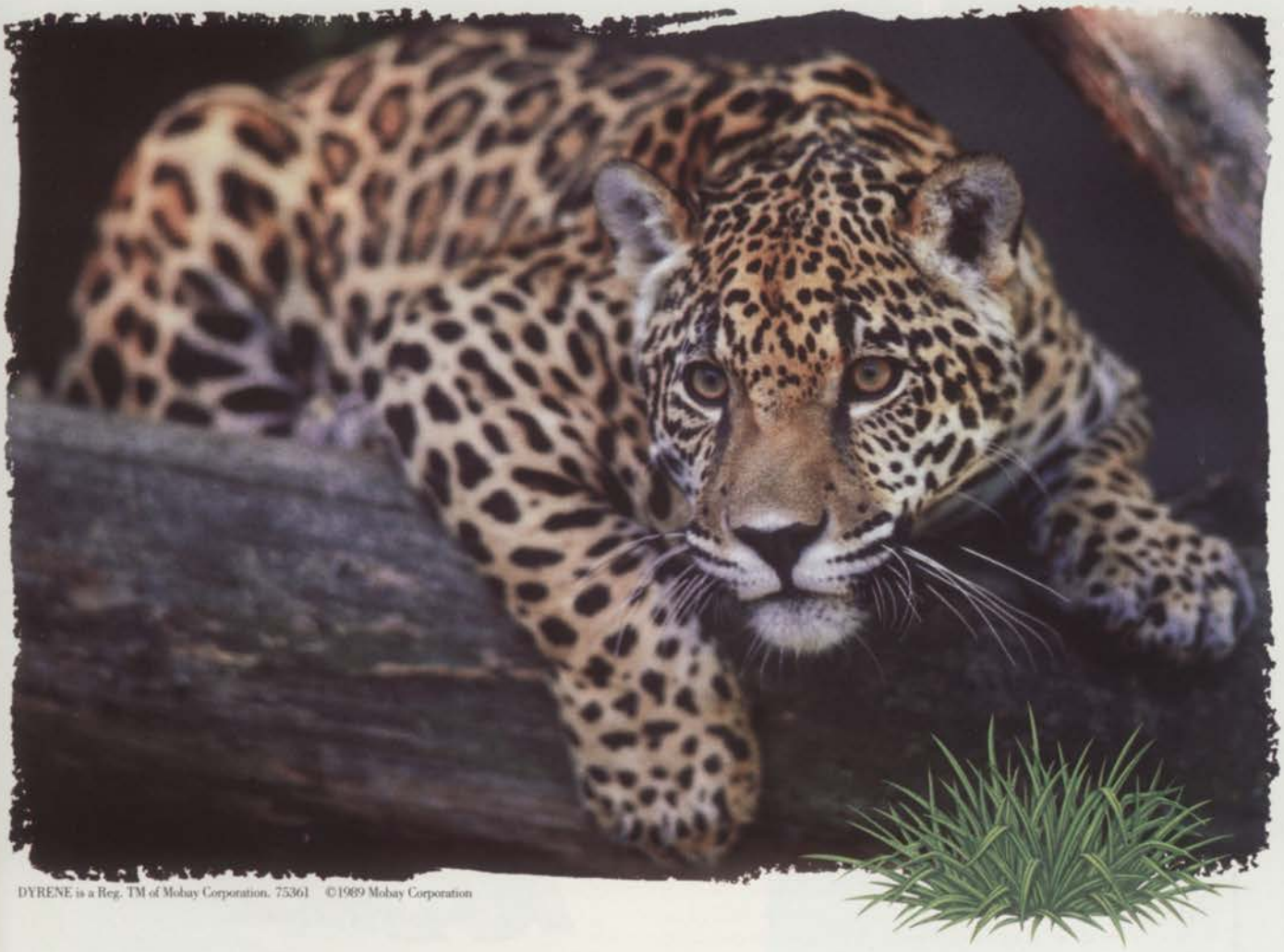
Lawns with a history of snow mold disease severity can be treated with fungicides. General fungicide recommendations include one application before the first snow cover, the second application during mid-winter and the third application after the snow melts in the spring. Among these three applications, the one that is made in the late fall, before the snow cover, is most beneficial and practical. Chemical treatments in the spring may not be very effective, since the damage has already been done. **LM**

Balakrishna Rao is Manager of Technical Resources for the Davey Tree Co., Kent, Ohio.

Questions should be mailed to Problem Management, LANDSCAPE MANAGEMENT, 7500 Old Oak Boulevard, Cleveland, OH 44130. Please allow 2-3 months for an answer to appear in the magazine.

494 06/03 10
29042

Some Things in Nature Were Meant to Have Spots. Your Turf Just Wasn't One of Them.



DYRENE is a Reg. TM of Mobay Corporation. 75361 ©1989 Mobay Corporation

DYRENE® 4 turf fungicide. Effective control in the prevention of leaf spot. It keeps your turf, and your reputation, looking good. There's no better way to keep your turf spotless.

DYRENE 4

Mobay Corporation
A Bayer USA INC. COMPANY

Bayer MOBAY

Specialty Products Group
Box 4913, Kansas City, MO 64120

Circle No. 123 on Reader Inquiry Card

For excellent shade performance . . .

RAM I

KENTUCKY BLUEGRASS

Most turf experts agree — good natural resistance to powdery mildew is an important factor in a bluegrass' adaptability to shade. Tests and use show Ram I to have excellent resistance to powdery mildew, lending to its outstanding shade performance.

Reaction of Kentucky bluegrass cultivars and selections to powdery mildew in a spaced-plant nursery at Adelphia, New Jersey.

Cultivar or Selection*	Powdery Mildew Rating 9 = most disease
RAM I	0.0
Glade	0.0
Nugget	0.0
Mystic	0.0
Touchdown	0.0
Sydsport	0.5
Plush	2.0
Baron	3.0
Cheri	3.5
Victa	3.5
Geronimo	4.0
Majestic	5.0
Bonnieblue	6.0
Adelphi	6.5
Vantage	6.5
Rugby	7.0
Parade	7.0
Pennstar	7.0
Fylking	7.0
Merion	8.0
Windsor	9.0

*Commercially available Kentucky bluegrass varieties

Whatever your bluegrass specifications, remember . . . what you seed is what you get . . . sow Ram I.

Ram I is a release of the U.S. Golf Association Greens Section/Rutgers University/Lofts Seed Inc.

Jacklin Seed Company
Post Falls, ID 83854/(208) 773-7581
(800) 635-8726

Lofts Seed Inc.
Bound Brook, New Jersey 08805
(201) 356-8700 • (800) 526-3890

Circle No. 116 on Reader Inquiry Card

RAM I
KENTUCKY BLUEGRASS
RAM I KENTUCKY BLUEGRASS IS A VARIETY PROTECTED UNDER THE U.S. PLANT VARIETY PROTECTION ACT.
P. V. P. NO. 7800069
UNAUTHORIZED SEED MULTIPLICATION PROHIBITED BY LAW.
THE LAWN INSTITUTE